1853

Quebec. Legislative assembly.
Return... and correspondence...
relative to certain railroads.

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RETURN

OF

SUMS PAID BY GOVERNMENT

AND

CORRESPONDENCE

BETWEEN

ENGINEERS AND OTHER OFFICERS

RELATIVE TO CERTAIN

RAIL-ROADS.

Printed by order of the Legislative Assembly.

QUEBEC:
PRINTED BY JOHN LOVELL, AT HIS STEAM PRINTING ESTABLISHMENT, MOUNTAIN STREET.
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RETURN

To an Address from the Legislative Assembly, to His Excellency the Governor General, dated the 8th November last, praying His Excellency to be pleased to cause to be laid before the House a Return shewing: 1st. "The sums paid by the Government up to this date to "the Corporation of the Railway now in progress between Toronto and "Barrie on Lake Simcoe, of the Great Western Railway and its "branches, and of the St. Lawrence and Atlantic Railway; and the "sums agreed to be paid for which Provincial Debentures are about to "issue to each of the said Railway Companies, and so as to show the "whole payments, votes of credit or pledges for principal or interest or "both from Government in aid of Railways."—2nd. "Copy of any "Reports or other Official Correspondence that may have taken place "between the Engineers and other officers employed by the Government, to report upon the condition and progress of the above Railways or the expenditure on the same, and the Executive Government "or any Head of a Department or Bureau thereof, since the close of "the last Session of the Legislature.

By Command,

A. N. MORIN,
Secretary.

Secretary's Office,
Quebec, 28th February, 1853.

No. 822.

Receiver General's Office,
Quebec, 12*th November*, 1852.

Sir,—I have the honor this day to acknowledge receipt of your communication of yesterday's date, and in reply have the honor to state,—

That the "Toronto and Barrie" Railroad Company have, up to this period, received no sum either in Cash or Debentures from the Government, but by Order in Council of $\frac{6}{8}$ instalment £100,000 sterling, 6 per cent. Debentures at 25 years, payable in London, are now under preparation for transmission to England for negotiation on account of such Company. By the said Order in Council it would appear that the said Company will be entitled to receive Provincial Debentures to the extent in all of £275,000 sterling.

The Great Western Railway Company have, up to this period, received neither Cash or Debentures from the Government, but Debentures of the Province 6 per cent. at 25 years for £200,000, sterling, have been transmitted to London for negotiation on account of said Company, but no advice of sale have so far been received as

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regards the St. Lawrence & Atlantic Railway Company; Debentures of the Province to the extent of £400,000 sterling have been negotiated in London on account of said Company, in accordance with statements laid before the Legislature during the present Session, the proceeds of which have been paid over to said Company under authority, with the exception of a sum of some £62,500 currency in the chartered Banks, at interest, awaiting the order of the Railroad Board.

I may in conclusion remark that when the Debentures for said Companies are negotiated in England, the proceeds are place to the credit of the Province with their Agents in London, subject to the Draft of the Receiver and Inspector General, conjointly, for the benefit of said Companies, under Order of Council.

It is not in the power of this Department to communicate any further information on the subject referred to.

I have the honor to be,
Sir,
Your most obedient servant,

E. P. TACHÉ,
Rec. General.

Hon. A. N. Morin,
Provincial Secretary, &c., &c.,
Quebec.

Public Works, Quebec,
25th February, 1853.

Sir,—I am directed to acknowledge the receipt of your letter of the eleventh of last November, requesting, by command of His Excellency the Governor General, that you might be furnished by this Department with "copy of any Reports or "other official correspondence that may have taken place between the Engineers and "other officers employed by the Government to Report upon the condition and "progress of the Railway now in progress between Toronto and Barrie on Lake "Simcoe, of the Great Western Railway and its branches, and of the St. Lawrence "and Atlantic Railway, or the expenditure on the same, and the Executive Govern-"ment, or any head of a Deparment or Bureau thereof, since the close of the last 'Session of the Legislature."

With reference to your request, as above, I am now instructed to transmit to you the following documents, connected with the respective Railways mentioned by you.

ONTARIO, SIMCOE AND HURON UNION RAILWAY.

Copy of Letter from S. Keefer, Esq., dated 31st May, 1852.
Copy of Report of S. Keefer, Esq., dated 15th June, 1852.
Copy of Letter from S. Keefer, Esq., dated 17th June, 1852.
Copy of Report of F. Cumberland, Esq., dated 2nd November, 1852.

GREAT WESTERN RAILWAY.

Copy of Letter from Secretary of Public Works to Chief Engineer of Public Works, dated 8th October, 1852.
Copy of Report of S. Keefer, Esq., dated 14th October, 1852.
Copy of Report of S. Keefer, Esq., dated 22nd December, 1851.
Copy of Letter from S. Keefer, Esq., dated 12th January, 1853.
Copy of Letter from S. Keefer, Esq., dated 19th January, 1853.

ST. LAWRENCE AND ATLANTIC RAILWAY.

Copy of Letter from the Honorable H. H. Killaly, dated 24th October, 1851.

Copies of Documents shewing expenditure on the Railway, to 1st July, 1852.
Copy of Memorandum of S. Keefer, Esq., dated 6th November, 1852.
Copy of Report of S. Keefer, Esq., dated 9th December, 1852.
Copy of Report of S. Keefer, dated 18th December, 1852.

I have the honor to be,
Sir,
Your obedient servant,
THOMAS A. BEGLY,
Secretary.

E. A. Meredith, Esq.,
Assistant Secretary.

Toronto, 31*st May*, 1852.

Sir,—I beg to report that I have completed my out-door examination of the Northern Railroad, and am now engaged in the Office endeavoring to make myself fully acquainted with all the subjects in reference to this Road, to which my attention has been directed by instruction.

The line has not been located any further north than Barrie. From thence to Lake Huron two lines have been run, one to Nottawasaga and the other to Penetanguishine. The Directors have come to no decision as to the proper one to be selected. Much difference of opinion prevails, while interested parties are anxiously watching the progress of events. My own opinion will be given in my next Report.

Upon the 62 miles between this City and Barrie, a good deal of work has been done, and from the progress now making there is every probability that the Road, as far as Bradford, will be in operation this Fall. The result of my inspection is by no means favorable to the character of the work so far as it has gone.

Instead of a first class Road, as the contract implies, it is scarcely equal to a second class Road. No part of the line has been graded for double tract, and all the mechanical structures have been adopted for single tract only, while for the most part, they are of a temporary and perishable character. As to gradients and curvature, several improvements can yet be made which will be of material advantage.

The Contractors engage by their contract to build a Road similar in its character to the Western Section of the New York and Erie Railroad, this Road it is therefore essential I should see before I can satisfactorily report, and as it will take the Engineers and other Officers of the Northen Railroad some three or four days to furnish me with the papers and documents called for, I propose to start immediately for Buffalo and run over the first 100 miles of the Road. At the same time I shall take the opportunity of ascertaining the dimensions of the largest Steamers plying to the Sault St. Mary, and endeavor to obtain some information in reference to the trade and commerce of Lake Superior.

Until I have obtained all the information I desire, it would be injudicious to make any disclosures, and I would therefore recommend that the above information be considered strictly Departmental. To enter further into detail at present is therefore unnecessary. My Report will be accompanied with such practical suggestions for the future management of this Road, as the peculiar circumstances under which it was begun, and is now situated, seem to demand. It is my impression that if the Government is to have any thing to do with this Road it will be for their interest to take the initiative without delay.

I have the honor to be,
Sir,
Your obedient servant,
SAMUEL KEEFER,
C. E. P. W.

Thomas A. Begly, Esq.,
Secretary Public Works, Quebec.

1st June. P. S. I delayed my departure this morning in the hope of meeting the Chief Commissioner, having learned by Telegraph that he was coming here to day. If I do not see him before noon to day, I shall leave in the afternoon Boat

S. K.

TORONTO, 15*th June*, 1852.

SIR,—Having completed the examinations in reference to the Toronto, Simcoe and Lake Huron Railroad as required by instructions received from the Chief Commissioner, I have now the honor to report thereon as follows :—

DESCRIPTION OF THE ROAD.

The Road extends from Harbour of Toronto, and connecting with Lake Simcoe at Barrie, will terminate upon the Georgian Bay of Lake Huron, either at Nottawasaga or Penetanguishine, as may hereafter be decided on ; if at the former place its length will be 90 miles, if at the latter 107 miles.

The location has been made as far North as Barrie, a distance of 63 miles from Toronto, and the Contractors have worked upon 41 miles of this portion.

To the northward of Barrie two lines have been run to Lake Huron ; one to the mouth of the Nottawasaga River, measuring 27 miles, the other to Penetanguishine, measuring 44 miles, and after some further examinations as to the prospect of forming a safe and commodious harbour at the former Bay, the two competing lines will be submitted for the decision of the Directors.

The terminus at Toronto has not as yet been fully decided on. As now located the Road approaches the City from the North West, and passing through the garrison reserve enters Front Street at the foot of Bathurst Street, opposite the Queen's Wharf. From thence by the conditions annexed to the aid granted by the City Corporation, the Company is under obligations to extend their Road along Front Street to the Market Square, and also to continue it along Palace Street to Parliament Street in the eastern quarter of the City, occupying nearly the whole frontage. The attention of the Directors, however, has lately been turned to the more suitable and appropriate arrangement of laying the Road upon the projected Esplanade, on a level with the wharves, and thereby bring it into more immediate connection with the wharehouses and shipping. The Esplanade extends along the whole frontage of the City, and is intended to be 100 feet in width, sufficient to accommodate both this and the Guelph line.

For the present wants of the Road, however, as well as for its future and permanent accommodation, it is proposed to run a branch laterally down to the Queen's wharf by a curve of 647 feet radius, giving the line a southerly direction, the same as that of the wharf. At this point the Harbour usually remains open all the winter, and this connection with the Lake business is therefore of the greatest importance.

On leaving the City limits the Road takes a northerly direction through the populous and productive Townships of York, Vaughan and King, reaching the summit between Lakes Simcoe and Ontario at a distance of 26 miles from the City, 752 feet above the latter, and 282 above the former, near the head-water of the east branch of the Humber, in the Township of King ; crosses Yonge Street near Mitchell's corner, 27 miles by rail, from Toronto, and entering Whitchurch descends by the east branch of the Holland River, traverses east and west Gwillimsbury, passing through or near the Villages of Newmarket, Holland Landing, and Bradford, skirting the westerly side of the Holland Marsh, and passing through Innisfil to near the shore of Kempenfeldt Bay, follows along the shore of that Bay to Barrie. The line touches upon the waters of Lake Simcoe at the Holland River and at Barrie.

On this portion of the Road the maximum grade going north is represented to be 60 feet to a mile, and of this there are 1067 miles distributed amongst 8 planes, the longest of which is $4\frac{1}{4}$ miles. The maximum grade going south is $52\frac{8}{10}$ feet per mile of which there are 744 miles distributed amongst 8 planes the longest of which is $1\frac{1}{2}$ miles.

The direct or air-line between Toronto and Barrie is 52 miles. The distance by the mail route 57 miles, and by the Railroad 63 miles. Compared with the air-line, the length of the Railway exceeds it by 21 per cent. The curvature on this distance measures 16 miles and is equal to 2176 degrees of the circle. The least radius after leaving the City limits is 1432 feet, the number of curves 74. (For more detailed information in reference to grades and curvatures see the tables (Appendix No. 1), and the plan and profile herewith submitted all of which have been obtained from the Chief Assistant Engineer, Mr. D. P. DeWitt).

Progress of the Work.

The work performed by the Contractors in grading, bridging, masonry and fencing, is equal to $24\frac{1}{4}$ miles of finished Road formation, exclusive of the superstructure Timber has been prepared and delivered for 30 miles of superstructure. The right of way purchased for 19 miles. Of Iron-rail 9000 tons has been contracted for, 2000 tons of which purchased in the City of New York have been shipped and 118 tons of it have already been delivered. A locomotive engine and 6 burthen cars have. also been purchased and are expected to arrive here during the present month The Iron-rail weighs 57 lbs. to the lineal yard, and is from the manufactory of Guest & Co., England. The greater proportion of the work now done is upon the first 40 miles, between Toronto and Bradford, which is rather more than half completed. The average daily force now employed consists of 1150 men and 250 horses; with this force, and at the rate of progress now making, it is confidently expected that the portion of the Road from Toronto to Bradford will be brought into operation about the 1st October next, considerably in advance of the time stated in the contract. From Bradford to Barrie, 23 miles, it is expected the grading will be completed, and the Contractors propose to prepare the line for the superstructure by the 1st of January next. The time allowed by contract for the completion of the first portion is 15th May, 1853, for the second 1st December, 1853, and for the the whole to Lake Huron, 1st June, 1854. In all probability, therefore, the Company will be in a position to claim the Government guarantee early next year, provided their work shall then be approved of. The amount of work now done toward Road formation, not including superstructure, is about one quarter of the whole, and for this the Contractors have received estimates to the amount of £100,000; the payments made to them amount to £83,290, which they have received as follows:

County of Simcoe Bonds of 1st January, 1852, papable in 20 years, leaving interest at 6 per cent. per annum, payably half yearly,	£20,000	0	0			
The Company "Special Bonds," payable in 10 years, interest at 6 per cent. in meantime,...............	15,000	0	0			
9058 shares of ordinary stock,...........................	48,290	0	0			
				83,290	0	0
In addition to the above, the Company's disbursements for Salaries and incidental expenses amount to.....	312	13	7			
And for "Preliminary Expenses" paid to Mr. Capriol, 44 bonds of £250 each, dated 7th Jany., 1851, payable 2nd Jany., 1858, with interest half yearly at 6 per cent. per annum,...........	11000	0	0			
				11,312	13	7
				94,602	13	7

If the Road is made to terminate on Lake Huron at the mouth of the Nottawasaga River, the contract will amount to £562,500; but if at Penetanguishine, it will be about £668,750.

Their contract, however, dose not include station houses, work and machine shops, or the purchase of land for the same, nor any expenditure at the termini for piers and docks, nor more than £300 per mile for Road furniture. These with the general and contingent expenses of the Company are estimated by the Chief Engineer, Mr. H. C. Seymour, in his Report to the Directors to amount to £750 per mile, making the total cost per mile £7000.

Character of the Road—It will have the broad gauge of Canada, 5½ feet between the rails.

No part of the Road has been graded for double track, and with the exception of the bridge on piles across the Holland River, none of the mechanical structures have been adopted for any more than a single track. In this respect the Road differs from the trunk line, and generally from other first class Roads in this and the neighbouring country, which for the most part have all their more important structures prepared and arranged for the accommodation of a second track.

The curves and gradients compared with other lines which have been surveyed or commenced in Canada, are not so favorable for doing an economical business as may be seen by reference to the following table:

TABLE OF CURVES AND GRADIENTS.

Name of Road.	Miles of least Rad.	Curvature.	Maximum grade ascending in direction of greatest tonnage.		Maximum grade ascending in direction of least tonnage.	
		Least Radius.	Miles.	Grade per mile.	Miles.	Grade per mile.
Toronto, Simcoe and Huron.........	...	1432	...	53 ft. going South	...	60 feet going North.
Great Western, ...	1	1910	...	45 ft. going East.	...	45 feet going West.
Toronto and Kingston, (Survey,)..	...	5280	...	30 ft. do do	...	40 feet do
Kingston and Montreal, (do) ...	...	Report not published.			...	
St Lawrence and Atlantic,..........	...	Not ascertained.			...	
Guelph, (Survey,)....................	...	3820	3.5	20 ft. going East.	6.0	53 feet going West.
Prescott and Bytown, ...	1.19	2865	...	30 ft. going North.	...	30 feet going South.
L. S. Louis and Province Line,....	...	2865	..	40 ft. going North.	...	40 feet going South.
Montreal and Rouse's Point, ...	...	Not ascertained.			...	

In passing over the line, it certainly did appear that a grade of 53 feet per mile rising to the north and 45 feet towards the south might have been obtained at some increase of cost and distance; such, at least, was my impression, but it would require instrumental examination to test the accuracy of this opinion. The Road attains an elevation of 750 feet above Lake Ontario in the distance of 21 miles, giving an average rise of about 36 feet per mile. Before this line was adopted, however, I learn that two others had been explored to the right and left by the valleys of the Don and Humber. In both of which I find by the exhibit of gradients submitted by the Engineer, (Appendix No. 2, grades as high as 72 feet per mile—see the Engineer's Report annexed, No. 2,) and still the fact of grades having been obtained on the Guelph line, where the mountain range has to be traversed nearly at right angles, with its direction over a summit of 920 feet above Lake Ontario, so much more favorable than those of the northern Road, would lead one to the conclusion that the same grades might have been obtained upon the latter. But however desirable it may be to reduce these grades to a par with any other Canadian Roads, too much work has been laid out already upon the present location to warrant any material change; some of them may yet be improved and considerably reduced by sinking the grade at the top of the plane and raising it at the bottom, but the long maximum grade of 4¼ miles, 60 feet per mile going north between the 16th and 20th miles, fixes it beyond hope of improvement, and stamp the character of the Road. This cannot be obviated except by change of line and increase of distance and curvature, or by such an amount of excavation at the summit of embankment at the bottom of the plane as would delay the opening of the Road for another season.

The same remark might be made with reference to the maximum grade in the 27th and 28th mile, ascending towards the South; but several other grades of the same inclination may be considerably reduced. A maximum grade once adopted, the Engineer appears to have used it at places, when at a little more expense, a better one might have been chosen, and the Road made less undulating. Such is the case, for instance, on the 3rd mile when the line approaches the City, crossing Dundas Street, the principal thoroughfare to the westward on a curve of 2865 feet radius, and a grade of 60 feet, 4 feet below the present level of the Road. A grade of 45 feet, would, at some more expense to the Contractors, lower the Road sufficiently to let the common Road pass over it by a bridge. The Guelph Road might pass under the street at the same place, and might then come into Town parallel and between the same fences with the northern for a distance of four miles. Without this modification the Guelph Line ought not to sacrifice its grades, but select another line where they can easily be maintained. The maximum grades ascending south in the 12th and 13th miles might also be reduced to 40 feet per mile.

In respect to curvature, there appears to be more of it, particularly approaching Newmarket and Barrie, than a just regard to the future economical working of the Road would warrant. In 63 miles there are 74 curves which, when added together, take us six times round the circle and eight of which are of the minimum radius of 1432 feet. Without instrumental examination I would not, however, pretend to say how many curves might be dispensed with or enlarged to a greater radius, but it appears certain that the two curves numbered in the plan and the annexed table of curves as Nos. 35 and 36, might have been avoided, and a straight line adopted in place of them, with scarcely any increase of cost to the Contractors.

The whole series of reverse curves from 30 to 36–7 in number, of 1432 and 1910 feet radius occurring in the distance of two miles, and within four minutes run of an engine, present a very bad appearance on the Plan and are highly objectionable; they will very sensibly increase the cost of maintenance, and their influence will be felt in the repair of track and repairs of engines and cars.

The broad gauge demands easy curves, and if so much work had not been laid out on these sections appearing to establish the present locations, a change might still be made for the better. It would be advisable to ascertain whether it might not yet be possible to adopt one uniform and easy curve for the whole. But if no better improvement can be made, it would be proper to insist upon the straight line in lieu of 35 and 36 even at the sacrifice of the work which has been laid out upon them.

Some other curves near Barrie numbered 72 and 73, and where, as yet, nothing more than the clearing has been accomplished, might possibly be avoided by taking a straight line. I shall take occasion to revert to this subject again in the latter part of this Report. From the 28th section onwards towards Barrie, I found several wooden culverts laid through the bank, some deeply covered, and others barely laid upon the soil. The Engineer in charge assured me these would all be taken out and replaced by stone culverts, which would be built at once if stones could be procured in the neighbourhood suitable for the purpose, and if not they would be built by the Contractors after the Road was in operation, when stones of the proper kind could be transported over it from a distance. The bridges, though few and unimportant, are all built of wood, without stone abutments, and occasionally one is found without the proper stone foundation under the ground sill. To prevent the heaving of these bridges from the frosts of winter, it will be necessary that their foundations be carefully and permanently laid.

All the square box culverts are built of dry rubble, and I would suppose, although I had not the means of ascertaining it, that the sizes of many of them will be found inadequate to the discharge of the floods in spring; some of those I saw were not well built, and will have to be taken up and relaid with better material. Those to be built in future should be made larger. The present ones are mostly 2 feet square inside. They ought to be at least 3½ feet high, to admit a man inside to clean them out or make repairs; and all culverts under banks, exceeding 10 feet in height, should be laid in cement.

The largest culvert on the whole 63 miles to Barrie, is a brick arch of 6 feet span, on the 6th mile; the mason's and bricklayer's work is faithfully performed, but the same cannot be said for the carpenters, for the sheet piling at the ends, intended to prevent the foundation being undermined, was a mere imposition, of no use whatever.

Sufficient care has not been observed on all occasions in removing material from the Road bed, which is unsuitable for it. On section 29, a portion of the bank, some 4 or 5 feet high, over a swampy piece of ground, was mostly made of the muck taken from the sides; but the Engineer informed me this would all be done over again. The muck removed, a proper seat prepared for the bank, and material brought from the adjacent cuttings to build it properly, as required by the specification, and as I had seen it done in section 54.

The drainage of "*barrowing*" *pits* and "*side cuttings*" appears to have been properly attended to, but in some few cases provision had not been made to give escape to the water dammed up by the road bank. In passing the summit through what is commonly called "the Oak Ridges," such provision may not be necessary, from the peculiar nature of the formation, the drainage in many parts of which does not take the ordinary course of rivulets and streams, but goes off through *sink holes* in the soil. In those cases when, from the presence of clay, the soil may prove impervious to the water-drains, or culverts will have to be made; and it will also be necessary to make occasional *catch-water* drains at the top of the slope, through cuttings, and *off-take drains* laterally, where the water remains stagnant at the two sides of the Road.

For the most part the Road passes through a country very favourable for making a permanent Road bed; the soil is generally sand, loam, or gravel; nearly all the cuttings furnish excellent material for ballast.

The water courses are generally passed near their sources and the drainage is comparatively light, so that the road, once properly constructed, can be cheaply maintained in perfect order.

A large proportion of the ties which have been delivered, are of Hemlock—a kind of wood which, in this Province, has heretofore been deemed unfit for being used even on plank roads. It will hold a spike well, while it lasts, but its life is considered of short duration. The contract allows the use of White Oak, Red Beach, Chestnut, Cedar, Tamarack, Black Ash, Butternut, Cherry, White Pine, Hemlock, or such other timber as the Engineer may approve of. Red Beech, Black Ash, White Pine, and Hemlock, I should consider unfit for the work; but, with regard to the last mentioned, I would not condemn it without making some further inquiry.

The Contract.

The tender made by the present Contractor is dated 16th Nov., 1850, and was based upon the previous survey made by Mr. Higham. In this they proposed,—"To construct the Road, including land (a maximum cost to be agreed upon); also "excavations, embankments, bridges, and all other structures required for a good "and substantial Railway; also, a well constructed and permanent track, with an "improved pattern of H rail, weighing not less than 56 lbs. to the yard; and also "so many cars and engines as were estimated to be wanted by Mr. Higham in his "report, all of first rate quality and plan, for the sum of $25,000 per mile."

For which they agreed to take payment from the following sources :—

Bonds of the County of Simcoe,	£50,000
Private subscriptions of Toronto secured by the 6 per cent. bonds of the Company,	50,000
Stock of the Company (with privileges of Charter,)	150,000

(Provided the City of Toronto give a bonus of £25,000 as a consideration) and the balance in 6 per cent. Debentures guaranteed by the Government, or in Stock, at the option of the Contractors.

This proposition was accepted by the Directors on the 27th Nov., 1850. On the 26th Dec., 1850, a memorandum of an agreement was drawn up at Toronto, which was afterwards, on the 16th March, 1852, reduced to regular contract form, and a specification for this manner of performing the work added. This instrument is yet imperfect for the want of the signature of the President and the corporate seal, but it has been signed by all the Contractors and may be considered as binding on all the parties.

In this contract they agree to build "*a single track Railroad upon a well con-*" "*structed and permanent track upon the route as now located*," and staked out to near the town of Barrie, and thence to such point on Lake Huron as the Directors shall select—"*in perfect running order and fit for use in every particular, and in its*" "*general character, style and description of work, appertaining to its construction*," "equal in *all substantial particulars to the Western portion of the New York and Erie*" "*Railroad, lately completed*," including all the necessary land, fencing, road and farm crossings, eight wood sheds, and water stations (not to exceed in cost £1000), two turn tables, switches, turnouts, (not to exceed 10,000 feet in length and not included in the longitudinal measurement of the work) and the necessary switches for the said turnouts, gates, drains, guard board, ballasting engines, and cars and all appurtenances thereto belonging or necessary for the proper working of the Road, of the most approved construction. The said cars and engines not to exceed in cost the sum of £300 per mile. The Company to build engine-houses and stations. All Engineers (except the Chief Engineer of the Company) to be named and appointed by Directors, but paid and approved of by the Contractors. Payments to Contractors to be made monthly, upon the following scale of prices :

Right of Way	£ 250	per mile
Grading, bridging and masonry	2875	"
Engineering	300	"
Agencies and contingencies	250	"
Timber for superstructure	300	"
Chairs and spikes	300	"
Iron rail	1500	"
Laying track	175	"
Cars and engines	300	"
Total	£6250	"

The specification annexed to this contract corresponds generally with the printed one I have obtained of the manner of doing the work on the Western Section of the New York and Erie Railroad, which provides for the best class of stone masonry in the culverts and abutments of bridges. For the latter the stones are specified to be of good quality and proper thickness, the face to the rock dressed, and the joints not to exceed ½ inch in thickness and to be well laid in cement. But towards the close I find the following Clauses added: Masonry corresponding with the foregoing descriptions will be required when stones suitable for that purpose can be obtained within a reasonable distance of the work, of which the Engineer shall be the judge. Where suitable stones for the above masonry cannot be obtained, rubble may, at the discretion of the Engineer, be substituted, composed of the best discription rubble stone or boulders that can be found within a reasonable distance of the work, to be laid and shaped in a good workmanlike manner under the direction of the Engineer.

AND FINALLY,

Either wood, bricks or stone may be used for the different structures, at the discretion of the Engineer.

After having inspected the work now in progress under this contract and specification, and not finding its character such as might reasonably have been expected from the terms of the tender and the previously quoted Clause of the more formal contract, wherein reference is made to the Western portion of the New York and Erie Railroad, I considered it important, before closing this Report, that I should go and examine it also; which with your approval I have done in a hurried manner, while going over the Road both ways, and attentively reviewing it from the back window of the last car of the train. The result of this examination is as follows:

The New York and Erie Railroad is divided into four grand Divisions, which are known as the Eastern, the Delaware, the Susquehanna, and the Western, each exceeding 100 miles in length. The western part of the Western is, as I learn, the portion last finished, and my examination extended over the first 90 miles east of Dunkirk to the Belvidere Station. On this portion the maximum grades ascending towards the east, in the direction of the greatest tonnage, are 40 feet per mile, in order to attain which a good deal of slate rock excavation had to be encountered.

The maximum grade in the contrary direction is 53 feet per mile.

Uniformity of grade seems to have been particularly attended to, and to this every obstacle is made to yield; on the other hand there is more curvature than a first class road ought to have, some of the curves might have been thrown out and the line made more direct at a little more expense of cutting; in no case, however, does the Engine slacken its speed for the curves on this division, and yet it might be more prudent to do so. All bridges and culverts have been made, and the Road has been graded for a single track only; all culverts are built permanently of stones, the smaller ones laid dry, the rest in cement; abutments to all bridges built of solid cut stone laid in hydraulic cement. Road and farm crossings and cattle guards towards the west end where material was scarce for masonry, are built of tressel work, but where stone was abundant, of good masonry in cement. The slopes of cuttings and embankments left in an unfinished state. Bridges are built after Howe's Patent, and covered from the weather; others again, after Burn's "Arch and "Truss," and left unprotected.

The switches are below the general character of the Road, especially for a broad gauge Road like this, the connecting rods are too slight, of 1¼ inch round iron instead of 1½ inch, and the signals attached to them too small and indistinct.

The rails are of the very best quality; in the whole length of 90 miles, I did not see a single rail thrown out from failure of any kind, but on the sharp curves between the Dunkirk station and the wharf in most trying situations, some are slightly bruised.

The wood and water stations are of the plainest description; much of the wood is unprotected from the weather. The fencing is very indifferent.

From a fair comparison of the two Roads, taken in connection with a just and equitable interpretation of the contract, I think it is right to assure—

1st. That all culverts should be built in a permanent and sufficient manner, of stone or brick, without using any timber, except for the foundations, and then only when such foundations are likely to be always under water.

2nd. That the abutments of all bridges should be built of the best description of cut stone masonry, laid in hydraulic cement, and the superstructure of the more important bridges properly protected against the influence of the weather.

3rd. That the maximum grades which have been adopted on the Northern Road are not sanctioned by the contract or the example referred to in it, and therefore that wherever it may still be practicable, they should be reduced as much as possible.

There is no stipulation in the contract either as to grades or curvature, the limits of these appear to have been arbitrarily assumed by the Engineer; had the maximum gradient of 60 feet per mile been reduced to 53 feet, and the minimum curvature of 1432 feet radius to 1910 feet, the character of the Road would have been materially improved, greater speed and regularity might have been attained, greater loads carried with the same engine, and the expense of repairs and maintenance would have been reduced. The fact of the existence of heavier grades and sharper curves on some of the best roads in the United States, is not in my opinion sufficient to warrant their adoption in this country, where the ground is more favorable to the construction of Railroads, and when, by proper care in the commencement, the Railroad system may be rendered much more efficient than even its heretofore wonderful results would leave room to expect. Had this Road been a part of the Main Trunk Line, I would consider it indispensable that the grades and curvature should be adjusted to the same scale as the rest, let the cost be what it may; but as it is not likely to have any competition for many years to come, and runs in a direction perpendicular to the Trunk Line, and has had so much work laid out upon it, tending to fix its character on the scale adopted, it does not appear that any material change can be insisted upon; but if there does not appear to be sufficient reason for reducing all the heaviest grades, and enlarging all the lesser radii, there are at least some very material improvements that can be made in both as before referred to, which might fairly be demanded.

If there are gradients on the Eastern and Susquehanna division of the New York and Erie, as high as 60 feet per mile both ways, and curves of so small a radius, as 955 feet; if on the Western Road from Albany to Boston, there are gradients of 82 feet in a mile and 116 feet per mile on the Baltimore and Ohio, it only shows that, with respect to these lines nature had imposed insurmountable obstacles to the adoption of those which were better adapted for economy and speed, and that we may be able to transport freight and passengers over the Northern cheaper than they can be carried over any of these Roads, but yet not so cheaply as they can be taken over the Great Western and the other branches of the Trunk Line.

Superintendence.

The other engagements in the United States of the Chief Engineer of the Company, Mr. H. C. Seymour, it would appear, are such as to prevent him devoting that share of his attention to the Northern Road, which the best interest of that Road seem to demand, and the want of his personal supervision seems very justly to have created some dissatisfaction amongst the Directors.

The work has been conducted heretofore under the immediate direction of his Chief Assistant Engineer Mr. D. P. DeWitt, who has accompanied me over the Road, and kindly furnished me with all the information and explanations, which, under your instructions I have thought it necessary to call for.

It is the business of the assistant Engineers under Mr. DeWitt, to make all the surveys, stake out the work, give the levels and working plans, and make the measurements of all work for the sub-contractors, both for lettings and for monthly estimates; in point of fact, to do the same duties for the principal Contractors which on other roads have to be done for the Company, and in respect to whom they stand in a similar relation.

The Directors have expressed their anxiety to have the Road finished in a satisfactory and creditable manner, and the Contractors, although the commencements which they have made, and the work which they have done up to this time has not been calculated to give entire confidence or satisfaction, have, each one of them with whom I have spoken, expressed a desire to meet the wishes of the Railway Board, and a readiness to make such alterations or changes for their satisfaction as may reasonably be desired.

Therefore adopting the supposition that the Government will grant the guarantee provided, all reasonable conditions be compiled with, I think no time should be lost in taking such action as may be considered most conducive to the public advantage. If the Government is to pay half the cost of the Road, it is but reasonable that it should have some voice in the direction, and therefore I take the liberty of offering the following:

PRACTICAL SUGGESTIONS.

I think it would be more satisfactory to all parties that an Engineer should be appointed jointly by the Railway Board and the Board of Directors, who should devote his whole time to the work, and should have full power under the authority of this Board to regulate curves and gradients, to report upon the termini, and upon all other matters for the information of the direction, and to require that all the work shall be executed in a permanent and satisfactory manner according to the full intentions of the contracting parties, and the necessary and reasonable requirements of the Railway Board. The charges and alterations which have been recommended in the previous part of this Report, if approved of, might form a part of the Engineer's instructions.

The Contractors would, of course, retain their own Engineers, who would continue to superintend the work as heretofore under the direction of the Chief Engineer appointed by the Directors.

The Contractors have heretofore been paid upon the brief certificate of the Chief Engineer that they are entitled to receive so much upon their contract, without any detailed statement being submitted to the Directors, shewing what work had actually been performed. I think the Directors who, as I learn, have all along been dissatisfied with these returns, have a just right to call for this detail upon the presentation of each certificate, and to require that the amount thereof should be based upon actual measurements and quantities of work performed under the contract, the same as the monthly certificates have been made out heretofore under the Department of Public Works.

With respect to the joint entry into the City of the two Roads, the Northern and the Guelph, as has been suggested by parallel lines, and within the same fences, and passing under Dundas street at the same Road bridges, I consider it important that some understanding should become to by the two Companies, in order that their united capital might be applied to making a suitable approach and terminus. The water frontage which each will require for its business, is yet the property of the Crown, and should be granted to them only on such terms as will give adequate facilities to each, and in proportion to its just acquirements without unduly favouring either, so as to secure the general welfare of all. This will form one subject for a Special Report from the Engineer who shall be appointed.

With respect to the northern terminus on Lake Huron, it will be understood from what I have stated in the first of this Report that, it would be premature to offer any opinion until a Report has been received of the surveys that are yet to be made; a personal examination would occupy more time than my other engagements would afford. I shall merely add, that from what I have learned of the nature of the formation at the mouth of the Nottawasaga River, as well as from the chart, I should say that the construction of a harbour at that place, in the full acceptation of the term and suitable for the wants of an extended trade, was a matter of impossibility. It remains to be seen what may be the result of the examination at the Islands called the Hen and Chickens. The advantages of a terminus on Nottawasaga Bay are:

1st. That the soil in this region is productive, and better adapted for settlement —and,

2nd. The Bay is less obstructed by ice any year than at Penetanguishine—and

3rd. As settlement advances and business increases, the Road can be extended onwards to Owen's Sound and Saugeen.

But at Penetanguishine, on the other hand, there is at once an excellent harbour, which it cannot be denied is of the greatest importance to the success of the undertaking, looking forward, as all parties do, to the through business with the Western States and territories bordering upon Lakes Huron, Superior and Michigan. As regards their comparative merits as harbours, I beg to refer to the accompanying letter, Appendix No. 3, from Captain Bayfield to the President of the Company, from whom it was obtained.

Before closing this Report, I desire to make a suggestion in reference to *cattle guards.* In the Act for the Northern Road, and in all the Railway Acts which I have yet examined, provision is made for gates at road and farm crossings, to prevent cattle getting upon the track. This arrangement, I imagine, has been taken from the practice in England; but in the United States more convenient and effectual contrivance has been adopted, denominated cattle guards, which consists simply of a pit, sunk across the track, in the line of the side fences, about 12 feet long, 6 feet wide, and 4 or 5 feet deep. The rails are laid across this pit, and the top left open, making a void over which cattle dare not venture to pass. Thus the opening and shutting of gates is avoided, as well as all the danger attendant upon them. It would be advisable to have all Railway Acts amended in this particular. It is the intention of the Contractors to place cattle guards upon the Northern Road.

As you may desire to have the opinion of the Chief Engineer, Mr. H. C. Seymour, upon the contract and the state of the Road, subsequently to his last inspection, I beg to refer you to his Reports of the 8th March, and 15th May, 1852, which you will find in the Appendix No. 4 and 5. I also add a Letter from the Chief Assistant, Mr. D. P. DeWitt, giving the information called for in reference to the Road, Appendix No. 6. A copy of the contract is also submitted.

I was desirous of adding an Estimate of the value of the work to be done upon the present location, but have not as yet obtained the necessary returns from the Engineer in charge to enable me to make it, without going into a lengthened calculation, from the longitudinal section herewith transmitted, which my other engagements would not admit of. The changes, however, which the Contractors may be called upon to make in the grades, curves, and manner of completing the mechanical structures, would affect this Estimate, and render it unimportant. Such an Estimate can be made at any future day, if required.

The progress made by the Contractors on the different parts of the Road may be seen at a glance, by reference to the accompanying profile, the parts tinted red shew the work done up to the 1st instant.

To save repetition, I have added a memorandum in the Appendix (No. 7) of the alterations proposed in the foregoing Report in the manner of constructing this road, which you will find convenient for reference, and a copy which, if approved, might be forwarded to the Directors, as the conditions of the guarantee. I have not said anything respecting the business prospects of this Road, as it did not appear to be necessary, more especially as the Chief Engineer, Mr. H. C. Seymour has done full justice to the subject in his last Report to the Directors, and has in a very able manner given a clear, convincing and encouraging statement of its anticipated business.

I have the honor to be, Sir,
Your obedient servant,

SAMUEL KEEEER,
Chief Engineer, Public Works.

NOTE.—The changes and alterations that might be made, as they occurred to me are marked in pencil upon the plans with observations, but as it would be impossible without making Surveys that would take several weeks to accomplish, to fix any of those definitely. I have not ventured to put any of them in ink ; they will be of service, however, to the Engineer who may be appointed, as the plan will have to be sent to him for his guidance.

SAMUEL KEEFER.

APPENDIX No. 1.

Ontario, Simcoe and Huron Union Railroad.—List of Curves shewing the length, radii and the inclination of the gradient.—Also, an exhibit of gradient shewing the total rise and fall and their length in miles and parts.

No. of Curve.	No. degrees per chord of 100 feet.	Radii in feet.	Length in ft.	Gradient per mile.
1	2	2865	616	16
2	2	2865	535	16
3	2	2865	800	26
4	2½	2292	560	26
5	2	2865	2050	60
9	1	5730	2555	60
7	2	2865	822	60
8	2	2865	750	60
9	3	1910	650	60
10	2	2865	912	60
11	1	5730	317	60
12	1	5730	1700	60
13	2	2865	900	0
14	2	2865	958	60
15	3	1910	700	60
16	1	5730	1900	60
17	1	5730	575	60
18	1	5730	900	60
19	3	1910	550	60
20	2	2865	600	60
21	2	2865	550	60
22	2	2865	450	6
23	3	1910	2250	43
24	3	1910	1223	17
25A	3	1910	1500	23
25	3	1910	700	22
26	3	1910	1200	22
27	3	1910	300	38
28	3	1910	1500	52.8
29	3	1910	2150	52.8
30	3	1910	633	52.8
31	3	1910	900	52.8
32	4	1432	1450	52.8
33	3	1910	1300	9
34	4	1432	900	9
35	3	1910	1400	9
36	4	1432	637	9
37	3	1910	266	6
38	3	1910	300	52.8
39	4	1432	1025	52.8
40	3	1910	333	5
41	4	1432	1275	5
42	3	1910	533	5
43	4	1432	1100	5
44	4	1432	1847	5
45	3	1910	758	5
46	3	1910	500	10
47	3	1910	1492	0
48	3	1910	1303	0
49	3	1910	3100	4
50	2	2865	1350	4
51	2	2865	700	4
52	2	2865	500	5
53	2	2865	400	12
54	2	2865	600	16
55	2	2865	800	13
56	2	2865	600	10
57	2	2865	1400	15
58	2	2865	700	21
59	2	2865	900	26
60	2	2865	1100	0
61	2	2865	1600	22
62	3	1910	900	22
63	3	1910	1800	0
64	3	1910	1800	60
65	3	1910	1400	60
66	2	2865	525	13
67	3	1910	1166	21
68	3	1910	1060	37
69	2	2865	1630	15
70	3	1910	2600	52.8
71	4	1432	2325	52.8
72	3	1910	1200	
73	3	1910	1100	
74	2	2865	3500	
Ascent and Descent—Toronto to Barrie,..................			45488	

Ontario, Simcoe and Huron Union Railroad, &c.—(*Continued.*)

	Ascent.	Descent.	Elevation of Summit above Lake Ontario.
Toronto to Summit,................	790.03 feet.	64.55 feet.	751.37
Summit to Barrie,.................	325.37 "	584.02 "	
Total,......	111.540 "	648.57 "	

Gradient in feet per mile and length in miles and parts.

	60 feet.	50 to 60.	40 to 50.	20 to 40.	0 to 20.	Level.	Total.	Total 52.8
Toronto to Summit,........	8.89	2.58	0.70	4.56	2.33	1.30	20.36	7.44
Summit to Barrie,........	1.78	6.17	1.67	10.07	17.52	5.47	42.68	

Maximum grade going North, 60 feet per mile 10.67 miles.
Do. do. South, 52.8 do 7.44 do.

APPENDIX No. 2.

Toronto, *July* 20*th*, 1851.

To the Hon. H. S. Boulton, President, &c.

Sir,—Mr. D. P. DeWitt, the Chief Assistant Engineer acting under my directions, has surveyed several routes for the line of your Road between Toronto and Bradford or Holland River, and also a line thence through Barrie to Lake Huron at the mouth of the Nottawasaga River. I beg leave to present herewith his statement relative to these surveys and the maps and profiles of the principal lines examined by him. From the personal examinations I have made of the country, and from a careful inspection of all the features of the various lines as determined by the surveys, I am now enabled to advise you of the route which in my opinion it is most desirable to adopt for the line of your Road, having reference to commercial and economical considerations.

Three routes have been instrumentally surveyed, and are designated as the Don, Middle, and Humber routes.

The Don Route has grades of too great an inclination, and is too long, compared with the other lines, to justify its selection.

The Humber route is of the same length as the middle, but has more curvature and grades of greater inclination. The maximum grades of the middle route are 60 feet per mile going North and 52 8-10ths going South, or in the direction the greatest trade with average grades of about 30 feet per mile. The road, if constructed on this route, will have less curvature and can be kept in repair at less cost than on either of the other routes.

After you shall have selected the route, I will direct a careful location of the line as required by your charter, correcting and improving it as far as possible, and lay before you the maps, plans and specification, representing the plan and character of the work to be constructed by Contractors.

I will also submit estimates of the cost of operating the Road and the probable business and profits of the same, founded upon such data as is usually relied upon in like cases.

The Board are no doubt aware that the maximum grades of the New York and Erie Railroad are 60 feet per mile in both directions, and that for most of its length it has much more and sharper curvature than yours; also that the Western Road between Albany and Boston has grades of 82 feet; the Baltimore and Ohio, 116 feet per mile. You will be able, therefore, to transport on the middle route cheaper than on any of the roads named, and I would advise the selection of this route, on which, after it shall be accurately located, to construct your Road and to adopt the general location as represented on the map herewith as far as Barrie.

I am, sir, very respectfully,
Your obedient servant,
(Signed,) H. C. SEYMOUR,
Chief Engineer.

ENGINEERS' OFFICE, TORONTO,
July 28th, 1851.

H. C. SEYMOUR, Esq.,
Chief Engineer of the
Huron, Ontario and Simcoe Railroad Union Co.

SIR,—I have the honor to submit, for your consideration, the maps and profile of the experimental Surveys made under your directions, extending from Lake Ontario, at the City of Toronto, to Lake Huron.

As the Charter has been materially changed since the Surveys made by Mr. Higham, inasmuch as the route is now required to touch at Barrie, or some westerly point upon the waters of Lake Simcoe, and consequently passing over a different part of the country, the information derived from his Surveys afforded no guide to the present explorations.

Three distinct Routes have been examined, viz., the Eastern or Don Route, commencing near the mouth of the Don River, thence through the Townships of Scarborough, Markham, Whitchurch, Gwillimbury, through the Villages of Unionville, New Market, Holland Landing, to the Village of Bradford.

The Central Route, commencing near the Queen's Wharf, thence following Bathurst St., or Brock St., (the adoption of one or the other of these streets as the route, yet to be decided), thence in a north-westerly direction to lot 30, 3rd concession, Old Survey, in the Township of York; thence northwardly, through the Townships of Vaughan and King, to the summit in Lot No. 11, 2nd Concession of King; thence north-easterly, crossing Yonge St. 1¼ mile south of Marchilles Corners; thence following the valley of the South Branch of the Holland River, intersecting the Eastern or Don Route at the Village of New Market. The Western or Humber Route, diverging from the Central Route 1½ miles from the foot of Bathurst Street; thence westwardly, in the Township of York, to the Village of Weston; thence following the Humber River, crossing the East Branch of this stream at the Village of Pine Grove; thence approaching gradually and crossing into the 9th Concession of the Township of Vaughan, near Cherry's Hill; thence in a north-easterly direction crossing the line between the Townships of Vaughan and King, in the 9th Concession, of Vaughan; thence crossing into the 8th Concession of King to the summit near the centre of the 8th; thence northwardly, crossing the West Branch of the Holland River near Oak Trees; thence following the north side of the Holland Marsh to the Village of Bradford.

The accompanying exhibit of gradients furnishes a correct comparison between the three lines, as to ascent, descent, &c.

The line from Bradford to Barrie follows the edge of the Holland Marsh, in the Township of West Gwillimbury, to the line between this Township and Innisfil, in Lot 20, Concession 14 of West Gwillimbury; thence westwardly to the summit in Lot 16, 10th Concession of Innisfil; thence to Thompson's Creek, crossing the Creek in Lot 14, concession 13, of Innisfil; thence in a north-westerly direction to the Village of Barrie.

The tabular form before referred to will show the maximum grade, ascent, descent, &c.

	MILES.
The distance from Toronto to Bradford, *via* Don Line, is........	43 07
" " " Central Line, is......	40 82
" " " Humber " is......	40 88
" Bradford to Barrie..........................	23 21
" Barrie to Nottawasaga Bay.....................	24 35
Total distance from Toronto to Nottawasaga, *via* Central Route, is	88 38

As material changes will in all probability be made in the line from Barrie to Lake Huron, the terminus not being established, I have not thought it necessary to enter into detail upon this portion of the Route.

Respectfully yours,
(Signed,) D. P. DEWITT,
Chief Assist. Engineer.

An Exhibit of Gradients.

Designation.	Don Route.			Central Route.			Humber Route.			
	Ascent.	Descent.	Height of Summit.	Ascent.	Descent.	Extent of Summit.	Ascent.	Descent.	Est. of Summit.	Ez. of Bradford.
From Toronto to Summit,,.	942	167	798	861	138	751	730	75	689	481
From Summit to Bradford,.	10	400	....	7	278	....	44	239		
Total for each Direction,...	952	567	....	868	416	....	774	314		
Total ascent and descent of each Route,...........	....	1519	....	1284		....	1088			

Grades per mile, and length of Grades from Toronto to Summit, in Ridges.

	151 feet maximum.	160 feet maximum.	72 feet maximum.	60 feet maximum.	52 ft. 8 in. maximum.	60 to 151 feet.	60 to 106 feet.	60 to 72 feet.	50 to 60 feet.	40 to 50 feet.	20 to 40 feet.	0 to 20 feet.	Level.	Total.	Total to Bradford.
Don Line,...........	0.74	....	....	....	....	3.54	....	....	6.95	1.40	7.20	7.77	0.41	28.01	43.07
Central Line,...... ...	....	....	....	6.22	....	....	....	....	5.87	1.84	5.96	5.20	0.36	25.45	40.82
Humber Line,........	....	....	1.2	....	....	....	....	3.9	2.91	2.70	6.32	4.28	4.80	26.11	40.88

Grades, &c., from Ridges to Bradford.

Don Line,............	....	1.6	....	....	....	....	0.28	....	0.81	....	2.44	9.33	0.60	15.06	
Central Line.	....	....	....	....	2.65	....	....	....	....	2.08	0.93	9.41	0.30	15.37	
Humber Line,........	....	....	....	1.96	....	....	....	....	4.67	0.48	2.81	7.19	1.56	14.67	

Grades, &c., from Bradford, to Barrie.

Bradford and Barrie Line,.............	....	....	....	0.43	....	....	....	....	3,27	2.44	8.44	7.44	1.19	23.21	....

	Bradford and Barrie Route.		
	Ascent.	Descent.	Extent of Barrie.
Bradford to Barrie,........	331	328	484
	659		

APPENDIX No. 3.

CHARLOTTETOWN, PRINCE EDWARD ISLAND,
8*th March.*

DEAR SIR,—In reply to your letter of 9th ultimo, which reached me by last mail, and in which you request my opinion as to the best terminus of the Railroad now constructing between Lake Simcoe and Lake Huron, I have no hesitation in stating that the excellent Harbor of Penetanguishine should be preferred as being, beyond comparison, superior to any harbor that could be constructed at the mouth of the Nattawasaga River, or in any other part of the Bay into which it discharges its waters. I very much doubt whether a harbor to admit any other than small vessels could be constructed at the mouth of the Nattawasaga, so as not to be liable to be barred up with the sand by the heavy N. W. Gales of the fall and winter; but even if that difficulty could be surmounted, the entrance to such a harbor must necessarily be so narrow as to be inaccessible except in fine weather, because of the heavy seas which those winds send into so large and open a bay, and which would render the position of a vessel unable to get in, perilous in the extreme. It seems to me that a Railroad should connect the principal harbors and Towns of a country, and as Penetanguishine is the only good harbor for shipping in the eastern part of Lake Huron, I think it must become the site of a considerable Town before many years.

I remain, dear Sir,
Very truly yours,

(Signed,) H. W. BAYFIELD.

APPENDIX No. 4.

Toronto, *8th March,* 1852.

Honorable H. S. Boulton,
President, &c.

Sir,—I have carefully examined the contract which the Board has caused to be prepared for the purpose of more fully explaining the original agreement between your Company and M. C. Story & Co., and compared the same with the original agreement at your request. I will make some suggestions in relation to the matters contained in the proposed contract.

I suppose the object had in view by the Directors and Contractors in the paper herewith is not to alter the existing agreements, but to explain it, and to put it in such clear and legal form as shall prevent diagreement between the parties as to the character and amount of work to be done and the compensation therefor.

Under the present agreement Contractors are required to furnish all the land necessary for the Roadway at a maximum cost to be agreed upon. They have agreed and are bound to make all the embankments, excavations, bridges and all other structures for a "good and substantial Roadway." They further agree to furnish and lay a permanent track with iron rail weighing fifty-six pounds per yard, &c.

This, no doubt, constrains Contractors to complete a Railway with a single track which shall be in all respects a good one. They further agree to furnish cars and engines as stated in Mr. Higham's Report. The contract requires the Contractors to do all the engineering required and generally to make the work specified good, substancial and permanent, consequently to use good materials and workmanship.

You ask me if it requires them to ballast the roadway, so far as I know: ballasting has not been required to be done under contracts, unless specially stated and required by the contract. To make a permanent track as required by the contract, I do not suppose in the absence of a specific requirement you can require Contractors to place gravel or sand to a certain depth over the roadway, whether any occurs along the line in their excavations or not, nor to cover the roadway with broken stone. I think you can require them to select from their cuttings as they work them, the best materials they afford, and to reserve them for the surface of the roadway, and you can require them to lay the lines in the most permanent manner adopted on any road, giving them a firm bearing on the road bed by the free use of hand rams, and to prepare the road bed by drains, side-ditches, &c., so as to ensure stability and permanency. I see no requirement in the contract, binding Contractors to construct fences. They are to furnish land, but I do not think that fences can be considered as land, or that the fact that they agree to furnish land carries with it an obligation to construct the fences, nor do I think fences a part of the roadway or superstructure.

Fences are not, in my opinion, any part of the work required under the contract; I think that in now agreeing upon the maximum price for land, say $1000 per mile, you should also agree upon a fair value of fencing per mile or rod, and upon a final settlement, allow Contractors the difference between the cost of land and fencing, and the rate agreed upon.

I do not discover that the contract makes any provision whatever for the erection of any stations, depots, or other structures of the kind. These structures are necessary to the economical use of a Roadway, and are a part of the ordinary appliances for its operation.

The Rroadway "Track" "cars" and engines are complete without them, as structures and machines, and I do not discover that Contractors have agreed to prepare the Railroad with all, or except as stated any of the appliances necessary for its economical use.

I was present when Mr. Story made and signed his proposition in New York, and he there stated that he did not propose to build any stations or shops, as it would be impossible to know their cost, and he thought that the price named was no more than enough to cover the cost of Railway and lands. When Mr. Story executed the contract in this City, you conversed with him on this subject, but I did not hear him ascent to your suggestions, that he would erect any stations. He did say something to this effect, that upon completion of the locations and plans of construction of the Road, contractors could better judge of the value of the work they had undertaken, and that in all matters they would deal with a liberal spirit as large Stockholders would naturally do.

If Contractors now undertake, as I think they will, to construct any stations, they will, in my judgment, so far undertake work not required by their present agreement with you.

They are, without doubt, required to build road and farm crossings, those being a part of the "roadway."

It is right and proper that side tracks should be constructed by them, and I notice they are willing to make in all 800 feet, which is enough to pass trains at, say 14 passenger and freight stations, and will meet the requirements of the business of the Road at the outset, except the double tracks which will be required at the termini.

I would suggest that the Road should be completed to Bradford or Holland River, at its opening, instead of Mitchell's Corner, thence to Barrie or adjacent, thence to its termination.

The contract as drawn, except as above noted, conforms as far as I can see to the time, spirit and intent, of the original agreement, and it is necessary to the interest of both parties that the whole matter be closed at an early day.

I will, should you direct, prepare the contract for the execution, but should rather do this in connection with your Attorney than alone.

I am, Sir, very respectfully,
Yours, &c., &c.,

(Signed,) H. C. SEYMOUR,
Chief Engineer.

APPENDIX No. 5.

TORONTO, *May* 15*th*, 1852.

To Hon. H. J. BOULTON,
President Ontario, Simcoe
and Huron, Union, Railroad Company.

SIR,—I returned yesterday from a careful examination of the line between this point and Bradford.

The progress of the work during the past inclement Winter has been very satisfactory. The grading is far advanced towards completion, and will be very nearly completed to Bradford by the first of August.

Between Bradford and Barrie a large amount of work has been done and the grading will all be completed this fall to the latter place. The progress of the work last Winter required that some wooden sluices should be placed under embankments at times when stone or brick masonry could not be made. At some points on the line it is impossible to find stone suitable for these structures, and as in very many of our first class roads wood must be used. The culverts made of wood will in many cases be taken up this season, and stone or brick substituted; in other cases they will remain till suitable materials can be transported over the line. It is not an unusual thing to place wooden sluices in Railway embankments and you will find them in nearly all our roads, and in all where stone is not found along the line.

These structures are now all being made of stone or brick.

The Contractors have purchased their iron for the whole line, and portions of it have been shipped to this port from New York. They will commence laying the iron in about six weeks. They have under my advice purchased one engine now nearly completed at Portland, Maine. This was the only engine that could be obtained in time, as it requires several months to construct these machines, and the Portland shop is the only one in America that had engines of 5½ feet gauge in process of construction.

The engine will be here in some six or eight weeks; the location of the shops in this City should be decided upon and arrangements made for their construction at once. I suppose that the Board may be able to make contracts with the Contractors for such shops as may be required at the outset. They will construct a water station as soon as possible after the location of shops shall be determined. The rapid progress of the work at the present time will enable Contractors to complete the Road to Bradford in October next, and to Barrie early next Spring.

The northern division from Barrie to Lake Huron, should be located at the earliest date possible. A locating party will be placed on the line after next week, with instructions to run a line for location from Barrie to Nottawasaga Harbor, and also to examine a line to the "Hen and Chickens," which is said to be a good harbor. As soon as these lines shall be examined, the maps and plans of location will be submitted.

Before this is done it will afford me pleasure, and I think it will be necessary to visit the proposed points of termination, with the Board, or so many of them as may be appointed for this purpose, and carefully examine the harbor and routes.

Very respectfully, &c.,

H. C. SEYMOUR,
Chief Engineer.

Toronto, May 15th, 1852.

ENGINEER'S OFFICE, ONTARIO, SIMCOE,
AND HURON, UNION RAILROAD,
TORONTO, *May* 15*th*, 1852.

To Hon. H. J. BOULTON,
President of Ontario, Simcoe,
and Huron, Union Railroad.

SIR,—The following statement represents, in a general way, the progress made in the construction of your Railroad. Iron is all purchased, to be delivered within 100 days. Two thousand tons are being shipped from New York, some of which is expected to arrive daily; the balance, 7,000 tons, is to be delivered in Quebec or Montreal, all made in England.

Twenty-five miles and more of grading, bridging, &c., completed.

Thirty miles of timber for superstructure delivered on the line.

Deeds for nineteen miles of right of way obtained, and nearly all the land as far North as Barrie has been contracted for, and deeds are being taken as rapidly as examinations into titles can be made.

The grading on sixty two miles is in rapid progress, and will be completed this Fall.

Forty-two miles of the Road will be completed and in use in October next. Over seven hundred thousand yards of excavation and embankment is now made.

One engine of 22 tons has been purchased and will be delivered in a few weeks.

Respectfully submitted.

H. C. SEYMOUR,
Chief Engineer.

Engineer's Office, Toronto,
June 1st, 1852.

To the President and Directors
of the Ontario, Simcoe, and Huron
R. R. U. Company.

I have the honor to acknowledge (in the absence of the Chief Engineer) the receipt of your communication, enclosing a "copy of a letter dated 24th instant, "from S. Keefer, Esquire, an Engineer acting for the Board of Works connected "with the Government, and asking for information under six different heads."

In compliance with your wishes, I beg leave to submit the following:

1st. The plan and profile of the line of Road as located, shewing curves and gradients.

2nd. 9,000 tons of iron have been contracted for, 2,000 tons of which, purchased in the City of New York have been shipped, and 118 tons have already arrived and been partly distributed upon the road.

A locomotive engine and six burthen cars have also been purchased, and are expected to arrive here during the present month.

3rd. The daily average force upon the line consists of 1150 men and 250 horses.

4th. The time allowed by the contract for the completion of sections 1 to 27 inclusive, comprising a distance of about 27 miles, extending from the City of Toronto to the Yonge Street crossing, near Mitchell's Corner, is January 1st, 1853. From sections 27 to 40, extending from Yonge Street to Bradford, a distance of about 13 miles, May 15th, 1853. From sections 40 to 63, extending from Bradford to Barrie, a distance of about 23 miles, December 1st, 1853. From Barrie to the terminus on Lake Huron, June 1st, 1854. It is proposed, however, to complete the grading from the City of Toronto to the Village of Bradford, provided no serious obstacle should impede the progress of the work, on or before the 1st day of October next. From Bradford to Barrie under favorable circumstances, the grading can be completed and it is proposed to prepare the line for the superstructure on or before January 1st, 1853.

5th. The amount expended upon the Road up to May 15th, 1852, is as follows:

19 miles right of way, at £250	£4750	0	0
30 " timber for superstructure, at £300,	9000	0	0
14¼ " grading, bridging, at £2874,	70,200	0	0
" engineering,	9450	0	0
Agencies and contingencies,	6600	0	0
	£100,000	0	0

6th. The number of miles of Road remaining to be built and the cost thereof, will necessarily depend upon the location of the terminus upon Lake Huron. If the mouth of the Notawasaga River should be selected, there would remain about 68 miles to be completed, and the probable cost would be £530,000. If the terminus should be at Penetanguishine Bay, the increased cost would amount to about £75,000.

This estimate includes depôts, machines, shops and rolling stock necessary to an economical and proper working of the Road.

I have the honor to be,
Sir,
Your obedient servant,

D. P. DEWITT,
Chief Assistant Engineer.

Memorandum

Of the alterations proposed in the manner of constructing the Toronto, Simcoe and Lake Huron Railroad, as recommended in my Report:

1st. That all culverts shall be built in a permanent and sufficient manner, of stone or brick, without using any timber, except for the foundation, and then only in places where they are likely to be always under water. All wood culverts to be taken out, and replaced by stone ones, and such stone ones as have been badly built, to be taken up and rebuilt in a permanent manner with better material. Proper sheet piling to be put at the ends of the brick culvert on section 6. All square box culverts yet to be built shall not be less than 3½ feet in height, and in places where the bank exceeds ten feet in height they shall be laid in cement.

2nd. The drainage to be made perfect. All stagnant water to be drawn off by drains or culverts—catch water drains to be made for the protection of slopes in cuttings, and lateral off-*take drains* wherever they may be necessary.

3rd. The abutments of all bridges shall be built of the best description of cut stone masonary laid in hydraulic cement, and the superstructure of the more important ones properly protected against the influence of the weather.

The abutments of farm crossings to be built in like manner, permanent stone foundations to be laid under the ground sills of tressel work—and walls of cattle guards built of good rubble masonary in cement.

4th. The maximum grades in both directions shall be reduced as much as practicable. The 60 feet grade going North, reduced to 53 feet, and the 53 feet going South to 45 feet wherever the nature of the ground will admit of it. A gradient of 43½ feet per mile shall be adopted in lieu of the maximum grade passing Dundas Street, which shall be carried *over* the Railroad by a suitable and permanent bridge. If possible the radius of the curve at this point shall be enlarged to the maximum of the Guelph Road, 3820 feet.

5th. That inasmuch as there are no less than 74 curves in the distance of 63 miles to Barrie, and some of them, particularly the reserve curves about New Market and Barrie, are highly objectionable, as many of them as possible shall be thrown out and shall be substituted either by straight lines or more easy curves. The minimum radius to be enlarged to 1910 feet, wherever the nature of the ground will admit of it—For example, if after instrumental examination it shall be found a straight line can be used in place of the reverse curves 72 & 73, near Barrie, it shall be done; likewise the curves 35 and 36 near New Market shall be superceded by a straight line, even at the sacrifice of the work already performed, and a straight line taken in place of 37 and 38, and if at any part of the line it shall be found upon careful examination that curves may be avoided, or eased off, it shall be done.

6th. No beech, black ash, white pine, or hemlock ties to be used for cross ties, but with respect to the last mentioned, as a considerable quantity has been got out, and as they are confidently asserted by the Contractors to be equally as durable as tamarack or cedar, their rejection or acceptance will be left an open question until further enquiry can be made.

SAMUEL KEEFER,
Chief Engineer Public Works.

Hon. John Young,
Chief Commissioner of Public Works,
Quebec.

Toronto, 15*th June*, 1852.

Toronto, 17*th June*, 1852.

Sir,—I have the honor to forward herewith my Report upon the Toronto, Simcoe and Lake Huron Railroad. It has grown to a greater length than I at first intended; but in order to meet the whole question where so many difficulties present themselves, as well as for the purpose of more fully informing the Railway Board upon all matters relating to this Road, I have bestowed more time upon this than it is hoped any of my future Railway Reports will demand. The plans and profile and contract will be forwarded by Express to save postage.

The appointment of an Engineer, it will be seen, is a matter of immediate necessity, and I earnestly hope the Railway Board may be fortunate in the selection of an experienced and skilful Engineer, one whose ability and discretion can be relied opon. So far as I have yet conversed with the Contractor, they seem desirous of completing the Road to the satisfaction of the authorities. The only thing to be regretted is that the plans of this location had not been submitted for the approval of the Railway Board at an earlier date, before commencing the work, for then the character of it might have been improved, to make it correspond more entirely with that of the Trunk Line generally.

I desire to state that from the Directors, the Contractors and Engineers, I have received every facility and attention that could be desired, and if any thing is yet wanting which my report does not furnish, I am sure they will most readily supply it.

I shall leave for Hamilton to-morrow morning, and after examining the Great Western Road and Port Stanley Harbor, I intend to leave for the Sault St. Mary sometime about the 1st July, but as time will not admit of making up a full Report on the Great Western before leaving, I intend merely to give the result of my examination in a short Report, deferring the other until my return from the Sault.

To pay the expenses of my Assistant going to the Sault, as well as such other expenses at that place, as Mr. Livingston may not be authorized to discharge, I beg to request that you will be pleased to place the sum of £200 at my command, and to direct that I may be informed of the channel through which it can be obtained.

I have the honor to be,
Sir,
Your obedient servant,

SAMUEL KEEFER,
Chief Engineer Public Works.

Hon. John Young,
Chief Commissioner, Public Works,
Quebec.

Toronto, 2*nd November*, 1852.

Gentlemen,—Herewith I beg to submit an Abstract of the General Estimate for the construction of your Line, exclusive of the Harbor works on Lake Huron, viz:

92 miles of Road as per contract, at £6250 per mile,...	£575,000	0	0
Depôt services as per detailed Report, ...	26,000	0	0
Rolling Stock do. do.	72,000	0	0
	£673,000	0	0

Of this sum, £275,000 sterling, will be provided by Government Guarantee, leaving £349,000 to be provided by the Company.

Referring to my original Report submitted to and approved by the Honorable the Railway Commissioners, I have to report that the changes in the location, in manner of construction and management recommended therein, are now in satisfactory course of execution, and that the work is being performed to my approval.

That the contract by which the full completion and equipment of the Road in manner required by the Honorable the Railway Commissioners, will be secured on equitable terms, has been agreed upon with M. C. Story & Co., and only awaits the sanction of the Commissioners for execution. That the expenditure upon the Road to this date, by the Company, inclusive of iron at Quebec, and of Company's service, has been £348,882 or £14,882 in excess of the total amount of the guarantee, and that the said supplementry contract provides for the immediate execution of the Harbor works, the cost of which, as before stated, has not been included in the above amounts.

I have the honor to be,
Gentlemen,
Your most obedient servant,
(Signed,) FRED. CHAMBERLAIN,
Chief Engineer.

The President and Directors of
The Ontario, Simcoe and Huron R. R. Co.

PUBLIC WORKS, QUEBEC,
8th *October*. 1852.

SIR,—I am directed to inform you, that the Board of Railway Commissioners have called upon this Department for your Report upon the Great Western Railway, the Company having applied for the Government Guarantee to the extent of £200,000 sterling, stating that they have expended over £500,000. The Board are of opinion that, under the Railway Guarantee Act, the Company must either divide the entire line into sections of not less than 50 miles in length, or adopt the entire line, which, under the circumstances, may, perhaps be the most convenient course, in either case the aid of the Government Guarantee can only be given on the Board being satisfied that one half of the Road has been completed.

Sir Allan N. MacNab has been written to by the Board of Railway Commissioners, calling his attention to the 18th 19th and 20th Sections of the Act 14th and 15th Victoria, cap. 73, and requesting that you may be furnished with such information on the subject by the Company, as will enable you to Report thereon to the Board, so that a Report may be furnished by them to His Excellency in Council, in accordance with the law.

I am, Sir, &c., &c.,
(Signed,) THOMAS A. BEGLY,
Secretary.

S. Keefer, Esq.,
Chief Engineer, Public Works.

BROCKVILLE, 14*th October*, 18

SIR,—In reply to your letter of the 8th instant, I beg to state that I have not yet made out any detailed Report upon the Great Western Railway. In the *ad interim* Reports which I sent in immediately after my inspection, I stated that the work was proceeding in good faith, that all the structures upon it were of a permanent character, that the grades and curves and all other arrangements generally, were such as were calculated to render it a first class road. The total expenditure up to that time was £383,039 including £14,043 for the Galt branch.

I have not been furnished with all the information necessary for making a detailed Report, not having received the Engineer's Estimate of the entire cost of the Road in the manner called for by the Commissioners' instructions.

Such information as I collected while on my Inspection tour, is in the office at Quebec, and when I have received the further information alluded to in your letter, I will return to Quebec and make out my Report.

The Road has been divided into three parts, as follows :

1st. The Eastern Division, from Niagara River to Hamilton.
2nd. The Central Division, from Hamilton to London.
3rd. The Western Division, from London to Windsor.

According to Mr. Stewart's Report, the Eastern Division is $42\frac{1}{10}$ miles long and is estimated to cost £248,667

The Central	$75\frac{8}{10}$	do	533,271
The Western	110	do	456,582
Total	$227\frac{9}{10}$	Total	£1,238,520

The Company desiring to avail themselves of the provisions of the Railway Guarantee Act, will have to intimate the manner in which they intend to claim the Guarantee, whether by divisions or upon the whole Line, and furnish me with the necessary information to enable me to Report thereon.

I have, &c., &c.,

SAMUEL KEEFER.
Chief Engineer, Public Works.

Thomas A. Begley,
Secretary Public Works, Quebec.

Montreal, *22nd December*, 1852.

Sir,—In compliance with instructions from the Commissioners of Public Works, I have the honor to submit, for their information, the following Report upon the Great Western Railway:—

My examination of this Road was commenced on the 18th June last, and completed on the 2nd July, where, from being obliged by instructions to proceed immediately to the Survey of the Sault Ste. Mary Canal, as well as from the necessity of allowing the Engineer of the Road a reasonable time for furnishing the information called for, I was unable to do more than briefly to Report a favourable opinion, and that I was satisfied with the general character of the work. Since then my time has been wholly occupied with other business for the Department of a more pressing nature, and it is only since completing my Report on the St. Lawrence and Atlantic Railway that I now find leisure to Report upon this Road. In replying to your letter of the 8th October last, I stated again that the works were proceeding in good faith, that all the structures were of a permanent character, that the grades and curves, and all other arrangements generally, were such as were calculated to render it a first-class Road, and that the total expenditure, up to this period of my examination, was £383,039, including £14,043 for the Galt Branch. I shall now proceed to give the information called for by the Commissioners and as required by law, adopting such an arrangement thereof as appears most convenient for reference.

1st.—The Location.

This line of Road occupies a position in reference to the Railroads of the Eastern and Western States, somewhat similar to that of the Welland Canal in reference to the navigation of the Lakes. It affords the shortest and best line for connecting them. In making his location the Engineer, aiming at a combination of Canadian and American interests, boldly struck out the most direct course which the great natural advantages of the country offered. Starting from the Niagara River, a little below the Falls, where a Suspension Bridge for the accommodation of the Railroads is now in course of construction, the line crosses the Welland Canal and descends to the water at Hamilton. He then crosses the Desjardins Canal, and passes in a very direct course through Woodstock, London and Chatham, to Windsor opposite to Detroit, the whole distance being 228½ miles, exceeding the direct, or "*air*" line, passing through Hamilton and London, only by about four miles.

It is proposed to cross the Welland Canal just below Lock 11, by extending the wing walls of that Lock and placing a swing bridge, opening from the east or basin side of the Canal, in the same relative position as the swing bridge lately placed at the foot of Lock 24 in the Village of Thorold. I can see no objection to this arrangement; to place the bridge midway between Locks 10 and 11, as proposed by Mr. Woodruff, the Engineer in charge of the Canal, would not only prove an injury to the navigation, but a serious inconvenience to the Road; as regards the Canal, it would divide a most convenient basin into two inconvenient ones, too small to afford the necessary accommodation for passing vessels in both directions at the same time; and as regards the Railroad, it would break up a long straight line 16⅝ miles in extent, and oblige the introduction of three or four extra curves, increasing the expense and the hazard of running the Road. It must be remembered that the place where the road passes the Canal, from its situation, and the extensive water power at command, is likely to become the seat of a manufacturing Town of some importance. When this ground is built upon, the approach to the bridge by a curve, will have the view obstructed by the buildings; the engine driver will not be able to see if the bridge is open or shut, and the greatest inconvenience and danger will result from such an arrangement of the crossing. The preservation of the straight line is therefore as important to the Canal as it is essential to the safety of the life and property embarked upon the rail. It does not appear to me that any better arrangement can be made, or that any other plan can be devised that will give less inconvenience to both interests. With respect to swing bridges over a Canal, I have ever found that less inconvenience results from placing them immediately at the head or foot of a Lock, than when placed by themselves separately; in the latter position they are more subject to collisions, and cause greater delay and injury to vessels than when sheltered by the walls of a Lock; here vessels being obliged to stop, the bridge offers no delay, it may be kept closed during the lockage, and when the vessel moves on, it has not sufficient headway to do any damage. On the other hand, if placed in the midst of a basin or dividing a tract, the vessel must slacken speed to pass it, and in windy weather such passage becomes extremely inconvenient.

The positions of the bridges on the Lachine Canal very forcibly illustrate these remarks, for while several collisions have happened to the bridges at Brewster's and Côte St. Paul, those at the head of Locks 2 and 3 have never received any injury.

The location of the Road through Hamilton is of a very expensive character. The design is obvious,—to make Hamilton an important terminus for the business of the West. To accomplish this, the Burlington Heights had to be cut through, the Desjardins Canal crossed, and the heavy Copetown cut encountered—all formidable obstacles. Undoubtedly the descent of the Main track to the water at this place, gives to the Road more of a Provincial character, but it has been at very great expense to the Company, and at a sacrifice of time in the use of the Road; for it cannot now be opened so soon as it might have been upon another location.

Upon inquiry as to whether the preliminary surveys ever extended to a line South of Hamilton, and between it and the Mountain, I was informed that such had been made, but the result was unfavourable. The discussion of the question of location, I perceived, would come too late to be of any practical advantage, for the work was then too far advanced upon the one already made to admit of any change. On the supposition, therefore, that a practicable line for the Main Trunk could have been obtained, passing immediately under the Mountain at Hamilton, and not descending within 100 feet of the water (leaving the business of that City to descend to the water by a branch), then gradually ascending the Mountain to Ancaster and passing on through Brantford (which would be a great object gained), it was still too late to agitate the question; for, suppose it capable of demonstration that a great saving could be effected, the Road completed in a short time, and the general interest promoted by the line designated above, it would only serve to show that when the Government is likely to be called upon for their guarantee, the question of location was one which ought to be selected before the work was commenced. That a good road will be built upon the present location, I see no reason to doubt; and, in the achievement of works of such local and general benefit by Companies, it seems desirable to leave the location and management as free as possible.

There is but one more point in the location to which it is necessary I should allude, namely, the position of the terminus at Windsor.

The plan prepared by the Company's Chief Engineer, Mr. R. J. Benedict, gave an ample and commodious portage on the River directly opposite to the central portion of the City of Detroit. It stopped, at the ferry, and the travel between that City and the Canadian side, did not cross the rails. The distance by ferry from his terminal buildings to those of the Michigan Central Railroad, with which the Great Western connects, was only one quarter of a mile more than to the nearest part of the City. I entirely approved of this arrangement, because it was economical, avoided interference with the ferry, and appeared sufficient for all reasonable purposes. It has been sought, however, on the part of those directly entrusted in the Michigan Central, to have the Road extended down the River to a point directly opposite their station, in order to shorten their ferry, and avoid any possible connexion with the Pontiac Railroad which enters more into the heart of the City. This change would oblige the Great Western to buy up and absorb the whole water frontage at Windsor, compel the common travel by the two ferries between this place and Detroit to cross the rails, and put the Company to a great deal of unnecessary expense. I would therefore strongly urge that Mr. Benedict's plan for the terminus at Windsor be still adhered to.

2. Progress of the Work.

From the earliest commencement of the Road, the attention of the Directors has been more especially devoted to pushing forward the works of the Central division (from Hamilton to London) on which the greatest amount thereof is situated.

The force employed upon the three divisions on the 15th July last was as follows:

Eastern division,	1,676 men, and	210 horses.
Central "	3,494 "	653 "
Western "	2,432 "	265 "
Total,	7,602 "	1,128 "

Besides 3 steam Excavators and 10 steam and Horse Pile Drivers.

The amount of work performed up to the 1st July was—

3,178,727	cubic yards material moved, earth, rock, &c.
17,233	" masonry laid,
7,124	" stones delivered,
493,711	Ft. Bd. M. of timber in Bridges completed.
1,381,937	do delivered.

The total expenditure to the 1st June was	£368,996
Exclusive of the Galt branch which amounted to	14,043
Total,	£383,039

For particulars of this expenditure, see the printed Statement annexed, marked (A.)

No part of the track has yet been laid, and it is not intended to open any portion of the Road until the whole line can be brought into use.

The time of completion was stated by the Engineer to be August, 1853, but for my own part, judging from the extent of work remaining to be done, I do not think it likely to be completed before November of the same year.

CHARACTERISTICS OF THE ROAD.

It is intended that this Road shall possess the distinguished advantage over all other American Roads, of having no level crossing in common with the ordinary country roads. The grade line has been so arranged as to allow the travel to pass over the Railway by bridges, or under it by culverts, and the track will be fenced in throughout its whole length. Arrangements most favorable for avoiding collisions upon a road intended for frequent trains at high velocity.

It is to have the Provincial gauge of 5 feet 6 inches between the Rails, while the American Roads with which it connects to the East and West are of a different gauge, namely 4 feet 8½ inches between the rails.

It will be graded for a single track, but the masonry of all bridges and culverts will be adopted for a double track. The single track will be 14 feet wide in embankments and 24 feet in excavations; double track 24 feet wide in embankments and 34 feet in excavations, slopes generally 18 inches base to one foot rise, ballast 2 feet thick, cross ties exclusively of oak, 9 feet long, not less than 6 × 8, and laid 28 inches apart from centre to centre. The rails which have been furnished are of three different patterns. The T rail weighing 70 lbs to the lineal yard, the bridge rail 70 lbs to the yard and the compound rail 84lbs to the yard. Great attention is paid to the joints and the different modes devised with each kind of rail for avoiding the shock in passing from one rail to another, seem well adapted for that purpose.

The maximum grade going eastward between the Detroit River and Hamilton, in the direction of the heaviest freight is 30 feet per mile, and between Hamilton and the Niagara River 39 feet per mile, while those going westward are 19 feet per mile between Niagara River and Hamilton, and 49,90 feet per mile from Hamilton to Windsor.

The summit east of Hamilton is at the St. David's Road, 3 miles from the Niagara River, and is 362,6 feet above Lake Ontario. The summit westward of Hamilton is at Woodstock, and is 762 feet above Ontario.

From the very complete returns furnished by the Chief Engineer of the Road, and appended to this Report (marked B.) it will be observed that the parts of the Road which are level, and under a grade of 5 feet per mile, amount to 118⅓ miles, more than half its whole length.

The minimum radius of curvation is 1496 feet, but that is confined to one curve of only a quarter of a mile in extent. There is one other curve of 1657 feet radius, and after that, there is none of less than 2865 feet radius; the curvation altogether, amounts to 10,34 degrees of deflection, while the whole distance, 228½ miles from Niagara River to Detroit River, the parts which are straight measure 211.40 miles and the parts curved, 17,10 miles. There is one straight line on this Road between London and Chatham 55 miles in length.

I have prepared the following Table for the purpose of exhibiting the comparative grades and curves upon the different portions of the Trunk Line and other connecting roads, as well as the state of the works, or the progress of the survey will warrant.

Name of Road.	Maximum grade ascending in direction of			Minimum	Curvation.	
	Length in miles.	Greatest traffic.	Least traffic.	Radius of curvation.	See degrees.	See distance.
		Feet per mile.	Feet per mile.	Feet.		Miles.
1. The Great Western, Niagara River to Hamilton,..................	42¼	39	19	2865	204½	3,24
Hamilton to Windsor,...........	186¼	30	50	1496	829½	13,86
Total,...............	228½	39	50	1496	1034	17,10
2. Toronto to Guelph,...............	47½	36	53	3820		
3. Ontario, Simcoe and Lake Huron,.	100	53	60	1496		
4, Main Trunk, Toronto to Kingston.	165	26½	40	2865		
Kingston to Montreal, ...	178	26½	40	2865		
Total,.................	343	26½	40	2865		
5. St. Lawrence and Atlantic,......	126½	58	58	1146	3768	32½
6. Quebec and Richmond,..........	100					
7. Atlantic and St. Lawrence, 147¾, S. L. and Al. Island Pond Sec. 15¾	163½	45	60	955		
8. Bytown and Prescott,..........	53¾	30⅓	29	2865		6¼

4TH.—QUALITY OF WORK.

The masonry of the bridges and arched culverts is laid in hydraulic cement, and as far as allowed, was of the most solid and durable character.

The design for each work was appropriated to its situation and uses. I had a favorable opportunity of observing the manner in which the foundations of some of the principal works upon the line were prepared and laid, and was gratified to find the engineering and workmanship so creditable to all concerned. If the works continue to be prosecuted in the same faithful and efficient manner in which they have been commenced, the Road will undoubtedly prove what it was intended to be, a first class Road.

5TH.—ESTIMATED COST.

According to the Returns marked (C,) and (D,) furnished by the Engineer and Secretary, the total cost of the Road will be £1,810,836, when completed and equipped for business, which is equal to £7925 per mile, on an average of the whole line. From these Returns I have compiled the following abstract, in order to exhibit more clearly the relative cost and rate per mile of each Division; these estimates are based upon the contract prices, a copy of which, marked (F,) is attached to this Report.

ESTIMATED COST OF THE GREAT WESTERN RAILWAY,

According to the Returns furnished by the Engineer and Secretary of the Road.

PARTICULARS.	Eastern Division. 42¼ miles.		Central Division. 75.9 miles.		Western Division. 110.36 miles.		Whole line. 228.51 miles.		Remarks.
	Cost.	Cost per mile.	Cost.	Cost per mile.	Cost.	Cost per mile.	Cost.	Cost per mile.	
	£	£	£	£	£	£	£	£	
Grading, including grubbing and clearing...	116685	2762	386917	5097	153943	1395	657545	2877	*The estimate for right of way having been omitted in the Returns above referred, the amount was obtained on the 21st Dec. by a Telegraph from the Secretary. The amount paid £67600 Amt. remaining 35000 Total £102600
Masonry including foundations	53862	1275	86831	1144	13707	124	154400	676	
Bridging and bridge superstructure	24166	571	38400	506	46893	425	109459	479	
Fencing	5906	140	10557	139	15209	138	31672	139	
Permanent way, including rails and ballast	69000	1632	119026	1568	161885	1467	349911	1531	
Buildings, stations and machine shops	9375	221	36313	479	16812	152	62500	274	
Engineering	12500	298	31250	412	12500	113	56250	246	
Totals	291494	6899	709294	9345	420949	3814	1421737	6222	
Right of Way and Depôts' Grounds...							*102600	449	
Rolling Stock, 20 Locomotive Engines, 4 eight wheel Mail and Express Cars					116725	511			
28 eight wheel Passenger Cars, 8 do Baggage do									
20 Emigrant 100 do Platform do									
150 House freight 100 four wheel gravel do									
25 four wheel repair 15 Hand ... do									
Machinery for Shops at Hamilton, London, Windsor and Elgin, and Turn Tables for Road					12000	53	128725	564	
Interest					98993	433			
Discount					14623	64			
Commission and Brokerage					18618	81			
Contingent Expenses					25540	112	157774	690	
							1810836	7925	

The large amount of interest in this estimate is accounted for by the fact, that the Company have agreed to allow the Shareholders 6 per cent upon the paid up stock during the construction of the Road. It is an item, however, which cannot fairly be charged against construction, for it is in fact only so much money returned to the Shareholders. After the opening of the Road they must of course depend upon the profits of the undertaking. The system of accounts kept with the Road appears to be clear and satisfactory.

By an agreement with the American Shareholders, two gentlemen were appointed on their behalf to examine the works and accounts, Mr. N. S. Benton, Auditor, and Mr. J. F. Clarke, Commissioner. The latter gentleman has recently been appointed the Chief Engineer of the Road, in lieu of Mr. Benedict, who has resigned.

With respect to the amount which the Company may desire to claim under the Provincial Guarantee, I am not informed. According to the Act, their work is not sufficiently advanced to entitle them to the benefits of its provisions, as no part of the Road has yet been brought into operation, while the plan of opening the whole at once, though undoubtedly good policy for the Directors, is unfavourable to their claim to the Guarantee, as regulated by law.

In consideration, however, of the good faith in which the works have been proceeding, the strenuous efforts made to carry them through, and the strong probability of their completion within a year from this time, a liberal course in dealing with the Directors would be fully justified.

The two points to which I would, in concluding, more particularly direct the attention of the Commissioners, are *first*, the crossing of the Welland Canal, and *secondly*, the terminus at Windsor. With regard to the latter, I might add, that the exclusive connection with the Michigan Central, proposed to be established and perpetuated, by placing the terminus lower down the River, might hereafter operate injuriously to the interests of the Great Western, inasmuch as the Pontaic Road is already of considerable perspective value to it, while doubtless other Roads will yet be made, centering in Detroit, whose business ought to be kept in view in all these arrangements.

All of which is respectfully submitted for the consideration of the Commissioners, by

Sir,
Your obedient servant,

(Signed,) SAMUEL KEEFER,
Chief Engineer, P. W.

P. S.—Full and complete Plans of the Location and Profiles of the Road have been prepared by the Engineer, at my request, and are now lodged in the Office of the Department at Quebec. It is most desirable that every Road Company to which the Provincial Guarantee is extended, should likewise furnish similar Plans and Profiles of their line, for the information of the public.

(Signed,) SAMUEL KEEFER.

A.—ABSTRACT STATEMENT of Affairs of the Great Western Railway Company.

RECEIPTS.

	£ s. d.	£ s. d.
Canadian Municipal Stock, 8000 Shares paid	103,850 0 0	
Canadian individuals do. 2736 do. 47 per cent . . .	31,194 15 11	
American do. do. 8000 do. 16 do. . . .	33,447 15 0	
English do. do. 2217 do. 96 do. . . .	53,616 18 0	
Contractors, or work done, 1579 do. 100 do. . . .	39,475 0 0	
Total . . . 22532 Shares, Average, 46 do.	261,584 8 11	
Forfeited Stock	2,157 19 8	
Total Receipts on Stock . . .	. . . .	263,742 8 7

EXPENDITURE.

	Eastern Division. £ s. d.	Central Division. £ s. d.	Western Division. £ s. d.	Galt Branch. £ s. d.	£ s. d.	£ s. d.
Grading	5220 15 3	145,346 3 3	9,126 13 11	9,869 0 0	169,562 12 5	
Masonry	670 5 7	31,248 10 1	0 0 0	123 3 9	32,041 19 5	
Bridging	26 5 0	5,254 7 7	695 9 6	444 0 10	6,420 2 11	
Superstructure	70 0 0	4,103 5 0	330 0 0	183 15 0	4,687 0 0	
Fencing	350 5 0	2,931 2 5	0 0 0	625 10 0	3,906 17 5	
Buildings	0 0 0	179 5 0	0 0 0	0 0 0	179 5 0	
Right of way . . , . .	4906 12 0	26,157 5 3	7,751 3 6	1,955 8 3	40,770 9 0	
Engineering	3479 16 4	13,597 19 2	5,166 11 11	842 17 2	23,087 4 7	
Rails.	0 0 0	0 0 0	0 0 0	0 0 0	59,532 18 8	
£	14,723 19 2	228,817 17 9	23,069 18 10	14,043 15 0		

	£ s. d.	£ s. d.	£ s. d.
Expenditure on Construction Account		340,188 9 5	
Interest on Stock Payments	£5045 4 1		
Do. on Bank Accounts	779 5 3		
Do. on Funded Debt	3243 10 10		
		9,068 0 2	
Discount on negotiation of £53,650—Municipal Debentures averaging 13 per cent. .		7,123 0 1	
Agency—Commission on Sale of Bonds.	£5250 0 0		
Brokerage on do.	3195 5 0		
Do. 345 Shares Stock	49 7 6		
Exchange, 12½ premium . . . . Sterling	£8494 12 6	10,618 5 7	
Expenses of Management in Canada, embracing Agents to England, Travelling Expenses, Law and Legislative Charges, Compromise with Niagara and Detroit River Railroad Company, Salaries, Stationery, Printing and Advertising, Police Force, Office Rent, &c., &c.	£14,709 19 10		
London Agency do.	1,331 13 4		
		16,041 13 2	
Total amount of Expenditure		. . . . . .	383,039 8 5

LIABILITIES.

		£ s. d.	£ s. d.
Funded Debt—Authorized issue of convertible Bonds of the Company for £210,000 Sterling, payable 1st October, 1857, at 12½ premium		262,500 0 0	
Floating Debt—Loan from Bank of Upper Canada, due November proximo . . .	£60,000 0 0		
Due sundry Contractors, being 10 per cent of work done, retained till completion of contracts	21,875 17 7		
Due Septimus Crooks, for Iron	2,920 4 7	84,796 2 2	
Total Liabilities		. . . . . .	347,296 2 2
		£	611,038 10 9

ASSETS.

	£ s. d.	£ s. d.	£ s. d.
Debentures on hand, viz :—			
City of Hamilton	£20,500 0 0		
County of Middlesex	11,000 0 0		
County of Oxford	1,500 0 0		
Town of London	6,800 0 0		
Village of Galt	10,400 0 0		
		50,200 0 0	
Bank of Upper Canada—in deposit		71,463 7 4	
London Agency do.		105,866 1 11	
Instruments and Furniture		469 13 1	
Total Assets		. . . . . .	227,999 2 4
		£	611,038 10 9

Office of the G. W. R. R. Company,
Hamilton, C. W., June, 1852.

Q. M. KENDRICK, Accountant.

B.

Table of Grades from Niagara River to Detroit River.

EASTERN DIVISION.

Length of Grade in Miles.	Ascent per Mile.	Descent per Mile.	Level.	Total Ascent of Grade.	Total Descent of Grade.	Total above Lake Ontario. Feet.	Remarks.
0.435	....	....	Level.	....	....	327.06	
2.406	14.78	....	....	35.56	....	362.62	St. David's Road at East end of Grade.
0.094	....	....	Level.	....	....	362.62	
1.609	....	33.79	....	....	54.40	308.22	
0.948	....	39.07	....	....	37.00	271.22	
0.757	....	18.48	....	....	14.00	257.22	
2.954	....	38.54	....	....	113.88	143.34	Welland Canal.
0.189	....	....	Level.	....	....	143.34	
1.213	....	34.84	....	....	42.24	101.10	
0.757	....	....	Level.	....	....	101.10	
0.948	....	10.56	....	....	10.00	91.10	
0.568	....	7.39	....	....	4.20	86.90	
1.325	....	21.12	....	....	28.00	58.90	
0.948	4.64	....	....	4.40	....	63.30	
2.442	....	....	Level.	....	....	63.30	
3.238	....	3.70	....	....	11.99	51.31	
2.462	....	....	Level.	....	....	51.31	
1.326	8.97	....	....	11.90	....	63.21	
2.083	....	10.56	....	....	22.00	41.21	
0.265	....	....	Level.	....	....	41.21	
0.682	16.80	....	....	11.52	....	52.73	
0.284	....	....	Level.	....	....	52.73	
0.473	....	16.27	....	....	7.75	44.98	
0.094	....	....	Level.	....	....	44.98	
0.852	4.22	....	....	3.60	....	48.58	
0.852	....	15.84	....	....	13.50	35.08	
00.94	....	....	Level.	....	....	35.08	
0.758	13.20	....	....	10.00	....	45.08	
0.189	....	....	Level.	....	....	45.08	
0.758	....	12.14	....	....	9.20	35.88	
0.947	....	....	Level.	....	....	35.88	
1.326	....	7.40	....	....	9.80	26.08	
1.704	....	1.06	....	....	1.80	24.28	
1.988	3.17	....	....	6.25	....	30.53	
0.663	19.00	....	....	12.60	....	43.13	
0.189	....	....	Level.	....	....	42.13	
2.083	....	12.00	....	....	25.30	17.83	
0.189	....	....	Level.	....	....	17.83	
1.160	7.92	....	....	9.17	....	27.00	
42.25							

CENTRAL DIVISION.

0.076	....	....	Level.	....	....	27.00	
0.891	....	29.56	....	....	21.00	6.00	
0.701	....	....	Level.	....	....	6.00	
5.929	45.45	....	....	269.52	....	275.52	
4.501	49.90	....	....	224.71	....	500.23	
3.882	1.84	....	....	7.17	....	507.40	
0.852	....	3.96	....	....	3.37	504.03	
0.795	7.92	....	....	6.30	....	510.33	
1.856	....	14.78	....	....	....	482.45	Beverly Branch.
0.132	....	....	Level.	....	....	482.45	Fairchild's Creek.
1.117	18.48	....	....	20.65	....	503.10	
0.037	....	....	Level.	....	....	503.10	

TABLE of Grades from Niagara River to Detroit River.—(*Continued.*)

CENTRAL DIVISION.—(*Continued.*)

Length of Grade in Miles.	Ascent. per Mile.	Descent per Mile.	Level.	Total Ascent of Grade.	Total Descent of Grade.	Total above Lake Ontario. Feet.	Remarks.
0.984	....	23.76	....	....	23.40	479.70	Dumfries Branch.
0.359	....	....	Level.	....	....	479.70	
2.859	40.12	....	....	114.76	....	594.46	
0.591	....	....	Level.	....	....	594.46	
1.586	....	22.96	....	....	36.40	558.02	Grand River.
0.208	....	....	Level.	....	....	558.02	
1.212	13.74	....	....	16.64	....	574.66	
1.079	21.64	....	....	23.37	....	598.03	
0.246	....	....	Level.	....	....	598.03	
0.549	21.91	....	....	12.03	....	610.06	River Nith at west end of this level.
2.481	....	....	Level.	....	....	610.06	
1.704	38.01	....	....	64.80	....	674.86	
0.757	....	....	Level.	....	....	674.86	
1.325	10.56	....	....	14.00	....	688.86	
0.852	....	21.12	....	....	18.00	670.86	Horner's Creek.
0.587	....	....	Level.	....	....	670.86	
0.947	21.12	....	....	20.00	....	690.86	
1.401	10.56	....	....	14.80	....	705.66	
1.515	15.84	....	....	24.00	....	729.66	
0.378	....	....	Level.	....	....	729.66	
0.757	....	15.84	....	....	12.00	717.66	
1.041	12.67	....	....	13.20	....	730.86	
0.984	31.68	....	....	31.20	....	762.06	
0.549	....	....	Level.	....	....	762.06	Summit level.
1.590	....	22.17	....	....	35.28	726,78	
0.151	....	....	Level.	....	....	726.78	
0.568	....	22.76	....	....	12.60	714.18	
0.321	....	....	Level.	....	....	714.18	Depôt Woodstock.
1.426	....	23.76	....	....	34.18	680.00	
0.189	....	10.56	....	....	2.00	678.00	
1.136	....	....	Level.	....	....	678.00	
5.113	....	7.6	....	....	39.12	638.88	
3.958	....	3.69	....	....	14.70	624.18	
1.515	13.20	....	....	20.00	....	644.18	
0.037	....	....	Level.	....	....	644.18	
1.666	....	4.22	....	....	7.24	636.94	
0,946	....	11.18	....	....	9.50	627 44	
1.704	....	....	Level.	....	....	627.44	
1.325	....	17.95	....	....	23.80	603.64	
0.378	....	....	Level.	....	....	603.64	
1.326	17.16	....	....	22,75	....	626.39	
0.189	....	4.48	....	....	0.85	625.54	
4.661	....	4.75	....	....	21.87	603.67	
1.041	....	15.84	....	....	17.17	586.50	
0.511	....	....	Level.	....	....	586.50	
0.408	....	21.64	....	....	9. 01	577.49	
75.91							

WESTERN DIVISION.

0.578	....	21.64	....	....	....	565.19	
0.435	....	15.84	....	....	....	558.29	
1.212	....	21.64	....	....	....	532.05	
0.056	....	....	Level.	....	....	532.05	
2.462	....	....	....	105.95	....	638.00	

TABLE of Grades from Niagara River to Detroit River.—(*Continued.*)

WESTERN DIVISION—(*Continued.*)

Length of Grade in Miles.	Ascent per Mile.	Descent per Mile.	Level.	Total Ascent of Grade.	Total Descent of Grade.	Total above Lake Ontario Feet.	Remarks.
2.083	....	....	Level.	....	....	638.00	
0.757	....	23.76	....	....	18.00	620.00	
0.946	....	7.39	....	....	7.00	613.00	
1.704	....	23.76	....	....	40.50	572.50	
0.303	....	....	Level.	....	....	572.50	
0.644	....	23.76	....	....	15.30	557.20	
1.193	....	15.84	....	....	18.90	538.30	
0.076	....	....	Level.	....	....	538.30	
2.240	15 84	....	....	35.40	....	573.70	
0.852	2.64	....	....	2.25	....	575.95	
1.136	....	15.84	....	....	18.00	557.95	
0.947	....	3.16	....	....	3.00	554.95	
2.272	....	15.84	....	....	36.00	518.95	
0.700	....	....	Level.	....	....	518.95	
1.382	....	15.84	....	....	21.90	497.05	
3.030	....	....	Level.	....	....	497.05	
1.515	....	1.05	....	....	1.60	495.45	
1.515	....	4.80	....	....	8.80	486.65	
1.136	....	....	Level.	....	....	486.65	
0.757	....	4.22	....	....	3.20	483.45	
2,083	....	....	Level.	....	....	483.45	
1.136	....	1.05	....	....	12.00	471.45	
1.704	....	....	Level.	....	....	471.45	
1.893	....	7.39	....	....	14.00	457.45	
1.325	....	2.11	....	....	2.80	454.65	
2.840	....	4.22	....	....	12.00	442.65	
1.893	....	....	Level.	....	....	442.65	
1.515	....	9.50	....	....	14.40	428.25	
1.893	....	15.84	....	....	30.00	398.25	
1.136	....	5.28	....	....	....	392.25	
1.041	....	15.84	....	....	16.50	375.75	
2.765	....	....	Level.	....	....	375.75	River Thames,
3.447	....	2.37	....	....	8.19	376.56	
2.215	....	....	Level.	....	....	376.56	
7.575	....	1.90	....	....	14.14	353.16	
0.946	....	....	Level.	....	....	353.16	Chatham.
8.143	....	1.90	....	....	....	337.68	
3.295	....	....	Level.	....	....	337.68	
0.379	10.56	....	....	4.00	....	341.68	Baptiste River.
0.113	....	....	Level.	....	....	341.68	
0.379	....	10.56	....	....	4.00	337.68	
1.421	....	....	Level.	....	....	337.68	
0.379	10.56	....	....	4.00	....	341.68	
0.095	....	....	Level.	....	....	341.68	
0.379	....	10.56	....	....	4.00	337.68	
3.789	....	....	Level.	....	....	337.68	
2.083	3.69	....	....	7.70	....	345.38	
0.189	....	....	Level.	....	....	345.38	
2.273	....	3.69	....	....	8.40	336.98	
0.189	....	....	Level.	....	....	336.98	
0.379	10.56	....	....	4.00	....	340.98	
0.189	....	....	Level.	....	....	340.98	River Ruscam.
0.454	....	10.56	....	....	8.40	336.18	
1.439	......	....	Level.	....	....	336.18	
0.776	1.05	....	....	82	....	337.00	
0.359	....	....	Level.	....	....	33.700	
0·208	10.56	....	....	2.00	....	339.00	
0·094	....	....	Level.	....	....	339.00	
0.189	....	10.56	....	....	2.00	337.00	

Table of Grades from Niagara River to Detroit River.—(*Continued.*)

WESTERN DIVISION.—(*Continued.*)

Length of Grade in Miles.	Ascent per Mile.	Descent per Mile.	Level.	Total Ascent of Grade.	Total Descent of Grade.	Total above Lake Ontario. Feet.	Remarks.
0.511	....	....	Level.	....	....	337.00	
0.378	10.56	....	....	....	4.00	341.00	
0.094	....	....	Level.	....	....	341.00	River Belle.
0.284	....	10.56	....	....	3.00	338.00	
2.803	....	....	Level.	....	....	338.00	
0.284	10.56	....	....	3.00	....	341.00	
0.113	....	....	Level.	....	....	341.00	Crane River.
0.188	....	5.28	....	....	1.00	340.00	
0.549	....	....	Level.	....	....	340.00	
1.890	1.05	....	....	2.00	....	342.00	
0.473	....	....	Level-	....	....	342.00	
0.189	10.56	....	....	2.40	....	344.40	Pike Creek.
4.640	....	....	Level.	....	....	344.40	
2.083	7.39	....	....	15.00	....	359.40	
0.568	....	....	Level	....	....	359.40	
2.785	....	13.20	....	....	25.00	334.40	
100.35							

* * *

SUMMARY OF TABLE OF GRADES.

Denomination of Grade.	Name of Division.			Total in Miles.
	Eastern.	Central.	Western.	
	Miles.	Miles.	Miles.	
Level and under 5 ft. per mile,	17360	26559	74441	118360
5 to 10 ft per mile,	4382	5916	7761	18059
10 to 20 " "	12465	16576	17353	46394
20 to 30 " "	1326	10890	8342	20558
30 to 40 " "	6724	2688	....	9412
40 to 45, 45, "	....	8786	2462	11248
45, 45, to 49, 90	....	4500	....	4500
Total,	42257	75915	110359	228531

Engineer's Office, G. W. R. R.,
Hamilton, 1st July, 1852.

TABLE OF CURVES on Great Western Railroad from Niagara River to the Detroit River.

EASTERN DIVISION.

Number of Curve.	Radius.	Total Deflection.	Length of Curves in Feet.	Gradient.	Remarks.
1	2865	68° 40	3433	14.78	
2	5730	31° 18	3130	14.78	
3	5730	31° 50	2300	33.79	
4	7640	8° 33	1153	33.79	
5	5730	25° 47	2580	18.48	
6	5730	32° 0	3200	38.54	
7	11460	3° 43	744	8.97	
8	11460	2° 44	547	15.84	
		204° 35	17087		

CENTRAL DIVISION.

1	2865	45° 43	2300		On Burlington Bay.
2	2865	19° 36	924	45.45	These Curves were originally in one, but were separated to put a Tangent between them to cross Desjardins Canal. It can be laid out as 1910 feet Radius.
3	1496	53° 34	1399		
4	1657	42° 26	1212		
5	5730	17° 00	1700		
6	2865	48° 00	2392		
7	5730	16° 30	1650		
8	5730	15° 30	1550	49.90	In Dundas.
9	2855	16° 00	800		
10	2865	30° 00	1500		
11	5730	5° 00	500		
12	5730	17° 00	1707		
13	5730	8° 53	888	49.86	
14	5730	7° 00	700	18.48	
15	5730	6° 00	600	23.76	
16	11460	6° 00	1200	Level.	
17	5730	12° 53	1288	40.12	
18	5730	10° 00	1000	40.12	
19	5730	14° 28	1447	40.12	
20	2865	31° 31	1584½	22.96	Grand River Plains.
21	5730	10° 45	1100	13.74	
22	5730	17° 36	1800	21.64	
23	5730	3° 50	350	Level.	
24	5730	4° 00	400	38.01	
25	5730	6° 30	700	12.67	In Woodstock.
26	5730	6° 30	700	23.76	
27	5730	12° 00	2400	23.76	
28	5730	4° 00	400	7.60	
29	6876	10° 50	1300	7.60	
30	5730	14° 10	1417	7.60	
31	9822	1° 45	300	7.60	
32	6031	4° 45	500	7.60	
33	5730	18° 45	1875	3.69	
34	5730	20° 00	2000	4.22	
35	5730	14° 20	$1433\frac{3}{10}$	17.95	
36	5730	13° 56	1393	17.16	
37	5730	13° 58	$1397\frac{3}{10}$	4.75	
38	5730	17° 54	1790	21.64	
		630° 38	47597		

TABLE OF CURVES on Great Western Railroad, &c.—(*Continued.*)

WESTERN DIVISION.

Number of Curve.	Radius.	Total Deflection.	Length of Curves in Feet.	Gradient.	Remarks.
1	5730	7° 06	710	21.64	
2	5730	2° 50	283	15.84	
3	2865	8° 0	400	21.64	
4	2865	8° 0	400	21.64	
5	5730	34° 14	3423	21.64	
6	5730	46° 52	4686	Level.	
7	11460	11° 38	2327		
8	11460	24° 20	4866	19.00	
9	11460	17° 38	3522	Level.	
10	11460	11° 28	2293	Level.	
11	5730	26° 42	2670	13.20	
		198° 48	25580		

SUMMARY OF CURVES IN MILES.

Division.	Radius in Feet.									Totals.
	11460	9822	7640	6876	6031	5730	2865	1657	1496	
Eastern, ...	0244	......	0218	......	......	2124	0650	......	......	3236
Central, ...	0228	0057	......	0246	0095	6103	1798	0229	0265	9021
Western, ...	2463	......	......	......	......	2230	0151	......	......	4844
Total, ...	2935	0057	0218	0246	0095	10457	2599	0229	0265	17101

Engineer's Office, G. W. R. R.,
Hamilton, 1st July, 1852.

TABLE of Tangent Lines on the Great Western Railroad, from the Niagara to the Detroit River.

Eastern Division.		Central Division.		Central Division.	
No.	Length in Miles.	No.	Length in Miles.	No.	Length in Miles.
1,	0,284	13	0.309	38	4,729
2,	1,216	14	8.067		
3,	0,229	15	1,202	Total,..	66,894
4,	1,735	16	0,447		
5,	1,357	17	0,709		
6,	16,669	18	0,575		W. Division.
7,	5,113	19	0 819		
8,	12.418	20	0,644	1	0.363
		21	1.980	2	0,043
Total,	39,021	22	1.484	3	0,390
		23	1,864	4	0,376
Central Division.		24	1.966	5	3.785
		25	9,691	6	3,768
1,	1.639	26	4,870	7	55,133
2,	0,290	27	0,612	8	12 990
3,	0.269	28	1,470	9	12.924
4,	0,077	29	0,449	10	14.783
5,	0,612	30	1,656	11	0,960
6,	0.406	31	1,211		
7,	0,361	32	1,074	Total,..	105,515
8,	0,297	33	1,082		
9,	0,429	34	4,428		
10,	0,102	35	4,000		
11,	2,919	36	1,480		
12,	0.627	37	2,014		

SUMMARY of Tangent Lines and Curves.

Eastern Division.		Central Division.		Western Division.	
	Miles.		Miles.		Miles.
Tangent Lines,	39,021	Tangent Lines,	66,894	Tangent Lines,	105.515
Curves,	3,236	Curves,	9,021	Curves,	4,844
Total,	42,257	Total,	75,915	Total,	110,359

Total length of Tangent Lines,	211.430
Total length of Curves,	17,101
Total in Miles,	228,531

AMOUNT of work done on Great Western Railroad up to 30th day of June, 1852.

Division.	Yards excavation earth.	Yards 3rd classification.	Yards indurated.	Yards Loose Rock.	Yards Solid Rock.
Eastern	165,695	22,982	100	...	2,893
Central	1,813,571	230,461	104,520	203,484	150,891
Western	253,107				
Galt Branch	188,800	...	...	1,600	5,700
Totals	2,421,173	253,443	104,620	205,084	159,484

Masonry on Great Western Railroad, ending 30th day of June, 1852.

Division.	Yards of Masonry.	Yards of Masonry.	Yards excavation Foundations.	Stone delivered.
Eastern	...	764	4,105	594
Central	2349	13,400	27,568	6530
Western	...	50	2,321	
Galt Branch	80	590		
Totals	2429	14,804	34,924	7124

Bridging on Great Western Railroad, ending 30th day of June, 1852.

Division.	F. in Brs. complete.	Timber delivered.
Eastern	...	117,000
Central	413,455	929,929
Western	...	209,700
Galt Branch	80,316	108,308
Totals	493,771	1,364,907

SUMMARY of Amount of work done on Great Western Railroad.

3,178 728	Yards of materials moved to 1st July.
17,233	Yards of Masonry laid to do.
7,124	Yards of Stone delivered to do.
493.771	Feet B. M. in Bridges complete do.
1,381,937	Feet B. M. Timber delivered do.

Engineer's Office, G. W. R. R.,
Hamilton, 1st July, 1852.

STATEMENT of the number of Men and Horses employed on the Great Western Railroad on the 5th of July, 1852.

No.	Division.	Totals.	
		Men.	Horses.
1	Eastern Division	1676	210
2	Central Division	3494	653
3	Western Division	2432	265
4	Galt Branch	354	76
		7956	1304

3 Steam Excavators,—10 Steam and Horse pile drivers.

Engineer's Office, G. W. R. R.,
Hamilton, 15th July, 1852.

C.

ESTIMATED cost of Great Western Railroad.

EASTERN DIVISION.

Grading, including Grubbing and Clearing,	$466,741 89
Masonry, including Foundations,	215,447 56
Bridging and Bridge Superstructure,	95,662 62
Fencing,	23,625 00
Superstructure, including Rails and Ballast, Buildings, Stations, Machine Shops,	276,080 00
Engineering,	37,500 00
	$1,165,977 07

CENTRAL DIVISION.

Grading,	1,547,667 67
Masonry,	347,321 32
Bridging,	153,600 42
Fencing,	42,230 00
Superstructure,.,	476,106 00
Buildings,	145,250 00
Engineering,	125,000 00
	$2,837,175 41

WESTERN DIVISION.

Grading,	615,772 03
Masonry,	54,827 96
Bridging,	187,572 30
Fencing,	60,836 00
Superstructure,	647,540 00
Buildings,	67,250 00
Engineering,	50,000 00
	$1,683,798 29

GALT BRANCH.

Grading,	$104,674 00
Masonry,	21,793 89
Bridging,	11,257 00
Fencing,	6,496 00
Superstructure,	74,823 00
Buildings,	10,000 00
Engineering,	15,000 00
	$244,043 89

ROLLING STOCK.

20	Locomotive Engines.	
28	Eight Wheel Passenger Cars.	
4	Do. Mail and Express.	
8	Do. Baggage.	
20	Do. Emigrant.	
100	Do. Platform.	
150	Do. House Freight.	
100	Four Do. Gravel.	
25	Do. Repair.	
15	Do. Hand,	466,900 00
	Machinery, for Shops at Hamilton, London, Windsor and Elgin, and Turn Tables for Road,	48,000 00
		$514,900 00

SUMMARY.

Eastern Division,	1,165,977 07
Central Division,	2,837,175 41
Western Division,	1,683,798 29
Galt Branch,	244,043 89
Rolling Stock and Machinery,	514,900 00
	$6,445,894 66

D.

Approximate Amount of Interest, Agencies, Discounts and Contingent Expenses incurred and to be incurred, during construction of Great Western Railroad, estimated till 31st August, 1853.

	£	s.	d.	£	s.	d.
Interest on Stock Payments, Bonded Debt and Bank Account per Company's Books, 30 June, 1852	10648	0	0			
Do. on Stock paid in (from July, 1852, to 31st August, 1853)	20370	0	0			
Do. on Arrears	742	0	0			
Do. on remaining calls Canadian and American Stock, (from 1st July, 1852, to 31st August, 1853)	9040	0	0			
Do. on English Stock, do. do.	12718	0	0			
Do. on Bonded Debt, do. do.	30625	0	0			
Do. on Loan from Bank of Upper Canada	3600	0	0			
Do. Government Loan, say £250,000 currency, for 9 months	11250	0	0			
				98993	0	0

Discounts,—On sale of Municipal Debentures per Company's Books to 31st June, 1852	7123	0	0			
On Municipal Debentures on hand and receiveable	7500	0	0			
				14623	0	0
Commissions and Brokerage,—On sale of Company's Bonds to 30th June, 1852	10618	0	0			
Do. do. do. on second issue do.	7500	0	0			
Agency on Stock Collections do.	500	0	0			
				18618	0	0
Contingent Expenses,—Law Charges, Travelling Expenses, Salaries, Stationery, Printing, London Agency, Police Force on Line, &c., &c., &c., per Company's Books, to 30th June, 1852	16040	0	0			
Do. do. do. to 31st August, 1853	9500	0	0			
				£157774	0	0

(Signed,) Q. N. KENDRICK,
Accountant.

Office of G. W. R. R.,
Hamilton, 29th September, 1852.

E.

SCHEDULE of Prices on Western Division, Great Western Railroad.

No. of Sections.	Excavation per Yard.			Masonry per Cubic Yard.		Foundations.				Road and Farm Bridges per thousand feet, board measure.	Timber in Sluices & Cattleguards per thousand feet, B measure.	Bridges per Lineal foot.			Superstructure per mile including Ties, Ballast, and Workmanship.
	Common earth.	3rd Classification.	Indurated.	Brick arches for Culverts	Brick abutments faced with Cut Stone.	Concrete.	Piling per Lineal foot.	Timber per Lineal foot.	Plank per M. ft. B. M.			130 feet Span.	160 feet Span.	40 feet Span.	
	$	$	$	$	$	$		$	$	$		$			
1	15	......	......	5½	6½	4½	......	10	12	18	......	......	......	......	1800
2	18	30	......	5½	......	4½	25	10	12	18	......	28	......	......	1800
3	18	......	......	5½	......	4½	......	10	12	18	......	......	......	......	1800
4	17	......	......	5½	......	4½	......	10	12	18	......	......	......	......	1800
5	18	......	......	6½	......	5	......	......	......	18	......	......	......	......	1800
6	19½	......	......	......	......	......	......	......	......	18	15	......	......	......	1800
7	16	......	......	......	......	......	......	......	......	18	15	......	......	......	1800
8	16	......	......	......	......	......	......	......	......	18	15	......	......	......	1800
9	16	......	......	......	......	......	......	......	......	18	15	......	......	......	1800
10	16	......	......	......	......	......	......	......	......	18	15	......	......	......	1800
11	18	......	......	......	......	......	......	......	......	18	12	......	......	......	1800
12	18¾	......	......	......	......	......	......	......	......	18	12	......	......	......	1800
13	18½	......	......	......	......	......	......	......	......	18	12	......	......	......	1800
14	17	......	......	......	......	......	......	......	......	18	15	......	......	......	1800
15	17	......	......	......	......	5½	......	10	12	18	15	28	......	......	1800
16	17½	......	......	......	......	......	......	......	......	18	12	......	......	......	1800
17	16	......	......	......	......	......	......	......	......	18	12	......	......	15	1800
18	14	......	......	......	......	......	......	......	......	18	15	......	......	......	1800
19	13½	......	......	......	......	......	......	......	......	18	15	......	......	......	1800
20	14	......	......	......	......	......	......	......	......	18	15	......	......	15	1800
21	14½	......	......	......	......	......	......	......	......	18	15	......	......	15	1800
22	14	......	......	......	......	......	......	......	......	18	15	......	......	15	1800
23	13½	......	......	......	......	......	......	......	......	18	15	......	......	15	1800
24	15	......	......	......	......	......	......	......	......	18	15	......	......	15	1800
25	15	......	......	......	......	......	......	......	......	18	15	......	......	15	1800
26	25	......	......	......	......	......	20	......	......	18	15	......	......	......	1800

E.—SCHEDULE of prices on Central Division, Great Western Railroad.

No. of Section.	Excavation per cubic yard.						Masonry per cubic yard.									Foundations.				Road and Farm Bridge per thousand feet, broad measure.	Bridges per Lineal foot.					Superstructure per mile, including ties, ballast and workmanship.
							Arched Culverts.		Box Culverts.		Bridge abutments.															
	Common earth.	3rd classification.	Indurated earth and cement.	Quick sand.	Loose rock.	Solid rock.	Fine dressed, coursed.	Hammer dressed, uncoursed.	Dry walls rubble.	Walls in cement.	First class coursed in cement.	Hammer dressed in cement, uncoursed.	Rubble in cement.	Rubble in lime.	Dry wall.	Concrete.	Piling per Lineal foot.	Timber per Lineal foot.	Plank per M feet, B. M.		100 feet span.	125 feet span.	130 feet span.	140 feet span.	160 feet span	
	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
1......	18	..	60	50	..	..	..	4¾	2½	4	6¾	..	4½	4	..	4	30	10 a 16	12	..	..	..	..	..	..	2000
2......	20	35	50	..	35	75	..	5½	2½	..	6	..	4½	..	..	4	..	10	12	25	..	..	..	..	..	2000
3......	18	..	50	..	30	50	7½	4½	2½	4	..	4½	4	..	..	4	20	20	12	25	...	..	..	..	..	2000
4......	16	30	..	..	35	50	..	4½	2½	3½	..	..	..	..	..	4	..	10	12	25	..	..	..	..	..	2000
5......	18	30	50	60	..	..	..	4½	3	4	..	..	..	..	..	..	..	10	12	25	..	..	..	..	..	2000
6......	22	35	..	60	..	..	..	5	..	..	..	..	..	..	..	..	..	10	12	20	..	..	..	..	..	2000
7......	16	22	..	..		..	..	5	..	..	..	..	..	..	..	..	..	10	12	20	..	..	..	..	..	1800
8......	18	30	..	..	..	..	..	6½	..	..	..	..	5	..	..	4	25	10	12	20	..	..	..	..	..	1800
9......	17	35	50	..	..	50	..	5	..	..	..	7	..	..	..	4	25	10	12	20	..	..	..	..	40	1800
10......	18	30	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	10	12	20	..	30	..	..	..	1800
11......	19	30	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	10	12	20	25	..	..	..	..	1800
12......	18	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	12	20	..	..	..	..	..	1800
13......	17	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	..	..	..	..	..	1800
14......	17	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	25	..	..	20	..	..	..	35	..	1700
15......	17	..	..	..	..	..	..	4½	..	..	..	..	..	..	..	..	..	10	12	20	..	..	..	..	..	1700
16......	20	35	..	..	30	..	..	4½	..	..	..	..	..	..	..	..	..	10	12	20	..	..	..	...	..	1700
17......	18	..	..	..	..	..	..	4½	..	..	..	..	..	..	..	..	..	10	12	20	..	..	..	..	..	1700
18......	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	...	..	..	20	25	..	..	..	..	1700
19......	19	..	..	..	..	..	..	4½	..	..	..	..	..	..	..	..	..	10	12	20	..	..	..	..	..	1700
20......	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	12	20	..	..	..	..	..	1700

Engineer's Office, Great Western Railroad, Hamilton, 1st July, 1852.

E.—SCHEDULE of the Prices on Eastern Division, Great Western Railroad.

	Excavation per cubic yard.						Masonry per cubic yard.									Foundations.					Bridges per Lineal foot.					
							Arched Culverts.		Box Culverts.		Bridge abutment.															
No. of Section.	Common earth.	3rd classification.	Indurated earth and cement.	Quick sand.	Loose rock.	Solid rock.	Fine dressed, coursed.	Hammer dressed, uncoursed.	Dry wall rubble.	Walls in cement.	First class coursed in cement.	Hammer dressed in cement, uncoursed.	Rubble in cement.	Rubble in lime.	Dry walls.	Concrete.	Piling per Lineal foot.	Timber per Lineal foot.	Plank per M. feet, B. M.	Road and Farm Bridges per thousand feet, broad measure.	100 feet span.	125 feet span.	130 feet span.	140 feet span.	160 feet span.	Superstructure per mile, including ties, ballast and workmanship.
	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
1......	17½	..	..	..	..	..	..	5	..	..	..	..	..	..	..	4	..	10	12	25	..	..	..	..	..	2000
2......	12½	..	..	..	..	..	..	5	..	..	..	..	..	..	..	4	..	10	12	25	..	..	..	..	..	2000
3......	14	..	..	..	..	..	..	5	..	..	..	..	..	..	..	4	..	10	12	25	..	..	..	..	..	2000
4......	14	..	70	..	..	..	7	5	..	4	..	..	..	..	..	4	..	10	12	25	..	..	..	..	..	2000
5......	13	..	..	..	..	..	..	5	..	..	..	..	..	..	..	4	..	10	12	25	..	..	..	..	..	2000
6......	21	35	70	..	30	50	..	5	..	..	..	..	..	..	..	4	..	10	12	25	..	..	..	..	..	2000
7......	30	40	70	..	30	50	..	5	..	..	..	..	..	..	..	4	..	10	12	25	..	..	..	..	..	2000
8......	14½	..	..	..	..	..	7	5	..	..	8	7	5	..	..	4	..	10	12	25	..	..	..	..	..	2000
9......	14	28	..	..	..	..	7	5	..	..	..	7	5	..	..	4	..	10	12	25	..	..	..	..	..	2000
10......	11	..	..	..	..	..	..	5	..	..	..	..	5	..	..	4	..	10	12	25	..	..	..	..	..	2000
11......	16	29	..	..	..	..	..	5	..	..	..	7	5	..	..	4	21	10	12	25	25	..	..	..	..	2000
12......	11	..	..	..	..	..	..	5	..	..	..	..	5	..	..	4	..	10	12	25	..	..	..	..	..	2000
13......	12	..	..	..	..	..	.	5	..	..	..	..	5	..	..	4	..	10	12	25	..	..	..	..	..	2000
14......	11	20	..	..	..	..	..	5	..	..	..	..	5	..	..	4	..	10	12	25	..	..	..	..	..	2000
15......	14	26	..	..	..	..	7	5	..	..	..	7	5	..	..	4	..	10	12	25	..	..	..	..	..	2000
16......	15	..	..	..	..	..	..	5	..	..	..	..	5	..	..	4	..	10	12	25	..	..	..	..	..	2000
17......	16½	..	..	..	..	..	7	5	..	..	..	7	5	..	..	4	21	10	12	25	..	..	..	..	..	2000
18.......	15	25	..	..	..	..	..	5	..	..	..	..	5	..	..	4	..	10	12	25	..	..	..	..	..	2000

Engineer's Office, Great Western Railroad, Hamilton, 1st July, 1852.

Montreal, 12*th January*, 1853.

Sir,—I have the honor to acknowledge the receipt of your letter of the 10th instant, transmitting a Resolution of the Railway Board in reference to my Report upon the Great Western Railway.

In compliance with the wishes of the Railway Board I have, by Telegraph, called on the Secretary of the Great Western Railroad to furnish me with the gross expenditure up to the latest period on the entire line, and upon each division of it, which I will forward as soon as received.

I am led to suppose that this is the only point on which the Board desire to be informed. The statement of expenditure given by me was that corresponding with the date of my inspection, and I had assumed (incorrectly as it appears) that when the Company advanced this claim for the Provincial Guarantee, they would, at the same time, give the Board a full statement of their expenditure up to the latest period.

With regard to my Report, I would beg, most respectfully, to remark that the words of the Resolution are not, in my opinion, justly applicable to it, " it appearing " evident that Mr. Keefer had not directed his attention to the Act of Parliament " amending the Railway Guarantee Act, 14 and 15 Vic.. cap. 73, Sec. 18, 19 and 20, " It was &c., &c."

Now if my Report of the 22nd ultimo, be again referred to, it will be found that my attention was most particularly directed to these very Sections of the Act above cited.

Under the several heads of Location, Progress of Work, and expenditure thereon up to 1st June, Characteristics of the Road, Comparison of Grades, Quality of Work, Estimated Cost, when completed, and in the concluding remarks I have given all that it appears to me, could be given in the then existing state of the work, to meet the requirements of this and the previous Acts. Towards the latter part of the Report will be found the following observation:—" With respect to the amount which " the Company may desire to claim under the Provincial Guarantee, I am not " informed according to the Act, the work is not sufficiently advanced to entitle them " to the benefit of its provisions *as no part of the Road has yet been brought into operation*, while the plan of *opening the whole at once*, though undoubtedly good policy " for the Directors, is unfavorable to their claim to the Guarantee as regulated by " Law." This is the conclusion at which I arrived, after consulting the Act 12 Vic., cap 29, Sec. 2, and comparing it with Act (referred to in the Resolutions) 14 and 15 Vic., cap. 73, Sec. 19, so that I cannot see how it can be fairly stated that I have not directed my attention to the Act of Parliamant amending the Railway Guarantee Act.

May I, in conclusion, request the favour of having these explanations laid before the Railway Board in vindication of my Report and thereby an obligation will be conferred on,

Sir,
Your obedient servant.

(Signed,) SAMUEL KEEFER·

Thomas A. Begly, Esquire,
Secretary Public Works,
Quebec.

MONTREAL, 19*th January*, 1853.

SIR,—In compliance with the Resolution of the Railway Board, a copy of which was sent to me in your letter of the 10th instant, I have now the honor to transmit the Statements yesterday received from the Managing Director of the Great Western Railway, shewing the sectional expenditure upon that Road up to the 31st December last, and the latest estimated cost of the same. I am informed that a copy of these Statements has also been transmitted to the Hon. the Commissioner of Railways.

With reference to these Statements, I beg to observe that the apparent discrepancy between the total and estimated cost therein given, and that stated in my Report, can easily be reconciled, by adding to the Statement, now transmitted, the Cost of the Right of Way, and the expense of Interest, Discount and Contingencies, which appears to have been omitted in making it up.

These corrections being made, the estimate will stand thus:—

The total estimated cost of the whole Road, according to Statement dated 12th January, 1853, now furnished, is........	£1,551,030	13	4
Add, omitted therein, Right of Way,.......................	102,600	0	0
Interest, Discount, and Contingencies, ...	157,704	0	0
Total....	£1,811,404	13	4
Total according to my Res., 22nd December,.................	1,810,836	0	0
Difference....	£568	13	4
The total expenditure on the construction account up to 31st December, 1852, including Rolling Stock, is given as	£859,009	6	10

I believe that I have now fully complied with the wishes of the Railway Board, and have furnished you with the exact amount of expenditure, up to the latest period, on the entire line, and also on each of the sections.

I have the honor to be, &c.,

(Signed,) SAMUEL KEEFER,
C. R. P. W.

Thos. A. Begly, Esq.,
Secretary Railway Works,
Quebec.

Sectional Expenditure till 31st December, 1852, on the Eastern Division of the Great Western Railroad, extending from the Eastern limits of the City of Hamilton to the Suspension Bridge, Niagara Falls, also shewing the latest estimated cost of some portion of the line.

No of Sect.	Length of Section.	Grading.			Masonry.			Bridging.			Total Expenditure.			Estimated Cost.			
		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	
1	3100 feet.	1321	7	6							1321	7	6	16176	17	6	
2	5500	930	12	6	415	16	7	125	0	0	1471	9	1	2586	16	8	
3	5100	434	10	0	462	8	6				896	18	6	2704	14	6	
4	5200	837	7	0	4674	16	3				5512	3	3	9791	16	0	
5	4200	1020	0	1	204	17	0				1224	17	1	3374	13	6	
6	6300	1845	10	1	632	16	3	3	1	8	2481	8	0	14893	13	0	
7	1300	7867	11	0	1059	7	6	6	2	10	8933	1	4	37613	18	0	
8	10900	1220	10	4	100	0	0				1320	10	4	8129	5	7	
9	8700	4942	18	2	4832	4	1				9775	2	3	25783	14	7	
10	10600	461	10	10	16	17	6				478	8	4	2550	18	1	
11	19400	3519	8	6	3652	17	11	4571	9	1	11743	15	6	40483	4	11	
12	3.22 miles	82	16	1							82	16	1	2906	5	0	
13	1.89	512	6	7							512	6	7	2067	10	0	
14	3.86	1586	9	9	897	3	9				2483	13	6	5753	2	6	
15	4.09	3181	8	3	1320	12	6	91	7	3	4593	8	0	9096	5	0	
16	3.99	861	4	3							861	4	3	3850	0	0	
17	4.16	1835	15	10	2224	1	5				4059	15	3	10653	2	6	
18	3.60	1578	7	6	153	0	0				1731	7	6	5672	3	0	
Superstructure including Iron											42773	0	0	69000	0	0	
Fencing											2423	17	6	6906	5	0	5906.
Engineering and contingencies											5965	3	5	12500	0	0	
Right of Way											16308	5	11	Right of Way			omitted.
Miles.	46.	34039	12	3	20646	19	3	4797	0	10	126953	19	2	292494	5	4	

Q. M. KENDRICK,
Accountant.

Office of Great Western Railroad,
Hamilton, 12th January, 1853.

Sectional Expenditure till 31st December, 1852, on the Central Division of the Great Western Railroad, extending from the Eastern Limits of the City of Hamilton to the Western Limits of the Town of London, also shewing the latest estimated cost of the same portion of the Line.

No. of Sect.	Length of Section.	Grading.			Masonry.			Bridging.			Total Expenditure.			Estimated Cost.			
		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	
1	3.14 miles	45269	5	10	10640	5	8	2490	15	10	58400	8	4	152806	12	10	
2	2.61	24924	8	5	3652	8	10	280	0	7	28856	17	10	38410	5	0	
3	1.83	24082	17	1	19305	1	6	1125	0	0	44512	18	7	56907	17	2	
4	2.48	9195	3	0	2456	3	9	25	0	0	11676	6	9	19764	1	3	
5	8200 feet.	23601	12	3	1598	15	0	168	15	0	25369	18	3	35758	16	2	
6	2.17 miles	13885	15	8	130	15	0	506	17	8	14526	8	4	20934	10	1	
7	28000 ft.	7466	19	11	1242	18	6	548	15	0	9258	13	5	10513	18	11	
8	5.11 miles	18075	0	1	5887	6	4	4164	13	1	28126	19	6	34125	15	0	
9	3.03	9276	5	2	7467	18	6	2930	12	2	19674	15	10	28979	15	2	
10	33000 ft.	21039	0	9	1383	1	2	3430	19	5	25853	1	4	35644	13	10	
11	28000	10107	14	10	720	2	11	977	19	9	11805	19	4	25392	7	8	
12	25800	6244	2	1	90	13	1	393	15	10	6728	11	0	13201	7	7	
13	27740	5392	11	8	365	13	4	199	9	6	5957	14	6	15957	7	10	
14	16200	2141	3	7	250	1	6	375	0	0	2766	5	1	8342	4	11	
15	18200	4748	8	6	533	9	0	231	10	0	5513	7	6	8589	5	1	
16	12600	3002	0	6	260	11	5	578	10	0	3841	1	11	6182	6	3	
17	18900	7839	11	8	528	4	10	113	17	0	8481	13	6	10155	19	0	
18	13820	4624	16	0	30	11	3	415	17	1	5071	4	4	10732	12	0	
19	27280	2388	7	6	1831	9	7	342	12	6	4562	9	7	12631	9	8	
20	24833	3600	17	0	50	0	0	....			3650	17	0	8468	11	0	
1	85000	231	5	0	6141	9	5	375	0	0	6747	14	5	12239	10	0	
Superstructure including Iron								....			77585	16	3	126026	10	0	
Fencing		....			....			....			5946	19	6	10557	10	0	
Engineering and contingencies........								....			16870	0	4	31250	0	0	
Buildings and machinery...					....			....			7104	1	10	....			
Right of Way		....			....			....			39200	8	6	....			omitted.
Miles.	77.50	247240	6	6	64567	3	7	19675	0	5	477590	12	9	728501	6	5	

Q. M. KENDRICK,
Accountant.

Office of Great Western Railway Company,
Hamilton, 12th January, 1853.

Sectional Expenditure till 31st December, 1852, on the Western Division of the Great Western Railroad, extending from the Western Limits of the Town of London to Windsor, on Detroit River, also shewing the latest estimated cost of some portion of the Road.

No. of Sect.	Length of Section.	Grading.			Masonry.			Bridging.			Total Expenditure.			Estimated Cost.			
	Feet.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	
2	9500	5918	9	6	1111	18	11	2759	7	6	9789	15	11	16612	16	0	
3	18000	5355	10	2	2133	10	10	26	16	0	7516	3	0	15144	9	2	
4	10000	119	0	0							119	0	0	6401	4	10	
5	16000	2938	0	0	2494	17	9	210	15	0	5643	12	9	14092	6	5	
6	14000	2021	7	7	183	2	4	48	15	0	2253	4	11	7959	14	11	
7	14000	1419	12	6	89	17	6				1509	10	0	1509	2	6	
8	17000	1752	0	0	441	17	7				2193	17	7	3309	2	3	
9	24000	1342	2	9				327	15	0	1669	17	9	3699	13	0	
10	22000	1404	0	0				155	15	0	1559	15	0	4115	4	11	
11	27000	2743	1	6	237	6	6				2980	8	0	6355	3	9	
12	28000	3279	13	9	194	18	9				3474	12	6	6474	3	3	
13	26000	3215	0	0				175	1	6	3390	1	6	4765	4	10	
14	28000	2317	10	0				86	5	0	2403	15	0	5440	2	0	
15	24000	6817	10	0				1614	15	10	8432	5	10	13481	0	4	
16	26000	4135	18	9				203	15	0	4339	13	9	7465	9	0	
17	26000	4577	10	0				52	10	0	4630	0	0	6400	7	6	
18	26000	2754	13	2				35	0	0	2991	13	2	4670	5	0	
19	26000	2064	5	4							2064	5	4	5411	16	0	
20	25000	1364	19	1				75	0	0	1439	19	1	11486	15	0	
21	28000	1866	5	7				75	0	0	1941	5	7	13369	1	3	
22	27000	2598	10	0				206	5	0	2804	16	0	5636	5	0	
23	27000	1342	5	10				64	17	6	1407	3	4	8366	15	0	
24	27000	2728	19	0				95	0	4	2823	19	4	6802	10	0	
25	27000	3883	16	3				1893	10	6	5777	5	9	6976	7	6	
26	25655	10096	13	2	392	4	4	1376	7	6	11865	4	9	30222	3	2	
Superstructure including Iron											112619	8	0	154885	0	0	
Fencing											2007	4	9	14809	0	0	
Engineering and contingencies											9082	11	0	12500	0	0	
Right of Way											23171	11	4				omitted.
Miles	109.80	98008	12	11	7280	0	6	9482	11	5	241701	19	11	401310	1	7	

Q. M. KENDRICK,
Accountant.

Office of Great Western Railway Company,
Hamilton, 12th January, 1853.

SUMMARY.

	Expenditure on Construction Acct. till 31st Dec., 1852.			Estimated Cost.		
	£	s.	d.	£	s.	d.
Eastern Division,	126953	19	2	292494	5	4
Central Division,	477590	12	9	728501	6	5
Western Division,	241701	19	11	401310	1	7
Rolling Stock,	12762	15	0	128725	0	0
£	859009	6	10	1551030	13	4

Q. M. KENDRICK,
Accountant.

Office of Great Western Railway Company,
Hamilton, 12th January, 1853.

OMITTED.

Add Right of Way,	£ 102,600	0	0
Interest, Discount & Contingencies,	157,774	0	0
Total,	£1,811,404	13	4
Total according to previous Return,	1,810,836	0	0
Difference,	£ 568	13	4

Montreal, 19th January, 1853.

S. KEEFER.

MONTREAL, *24th October* 1851.

SIR,—Application having been made by the St. Lawrence and Atlantic Railroad Company, for the Guarantee provided for under 12 Vic., cap. 29, and as it is necessary that prior to their being entitled to the benefit of such Guarantee, the Board of Railroad Commissioners shall make certain Reports thereon to the Governor in Council, I have the honor to report, for the information of those Commissioners, upon such portion of the details as appear to me to fall more immediately within the sphere of my combined duties as one of the Commissioners of Public Works, and of the Railroad Commissioners.

The Commissioners are enabled from my statement and description of the Works in January last, and their own subsequent acquaintance with and visit to them, to make the necessary Report on the several points enumerated in the 18th Section, chap. 73, 14 and 15 Vic., the principal of which, connected with my combined duties, are the approval of the selected line of Road, of the intended guage, the form and weight of the rail, and the general mode of construction of the Road and the works connected therewith. Since my inspection of the Road, a considerably increased length of it has been completed, or so nearly, as to be now available for public travel, and the amount of work done in continuation is not only more than half of the entire length, but constitutes much more than half of the entire cost of the whole Line.

By the 20th Section, chap. 73, 14 and 15 Vic., the Railroad Board are required to report that the land for the whole Railway has been acquired and paid for, and as the most satisfactory mode of satisfying the Board on this point, I had an interview with the Vice President of the Board this day, who informs me that the entire line of Road is not only located, but the land acquired and the works in various stages of progress on nearly the entire length of it. That Officer has sent instructions to the Officer in Sherbrooke, to send to the Board such documents as will satisfy them fully on this head; a point that, although it might in certain cases be of importance, is but of trivial consequence in this, as from the valuation and unoccupied character of the land, no difficulty whatever could, under the several Acts, exist to the acquisition of it.

I am, Sir,
Your obedient servant,
(Signed,) H. H. KILLALY.

Thomas A. Begly, Esq..
Secry. to Commissioners
of Railroads.

Expenditure of the St. Lawrence and Atlantic Railroad Company up to 1st July, 1852.

CONSTRUCTION.

1st Section,	£262169 8 8		
2nd "	270089 4 7		
3rd "	139293 16 11		
4th "	39353 1 9		
	£710905 11 11		
Incidental Expenses,	12501 7 11		
		723426 19 10	
Equipment,		47955 1 2	
			£771362 1 0

CONSTRUCTION.—1st Section.

1851.			
Nov. 30.—To Balance,			£251971 18 0
Dec. " To Expenditure,		£929 8 8	
1852.			
Jany. " To do.		2625 7 8	
Feby. " To do.		2045 10 3	
March " To do.		1404 3 0	
April " To do.		673 14 1	
May " To do.		737 10 0	
June " To do.		1781 17 0	
			10197 10 8
			£262169 8 8

CONSTRUCTION.—2nd Section.

1851.		
Nov. 30.—To Balance		£253738 0 1
Dec. " To do.	£4590 3 7	
1852.		
Jany. " To do.	2311 17 5	
Feby. " To do.	1104 8 10	
March " To do.	4916 10 7	
April " To do.	871 6 2	
May " To do.	1125 3 3	
June " To do.	1401 14 8	
		16351 4 6
		270089 4 7

CONSTRUCTION.—3rd Section.

1851.								
Nov.	30.—	To Balance,				£102263	12	0
Dec.	"	To Expenditure,	£8652	18	0			
1852.								
Jany.	"	To do	5909	10	9			
Feby.	"	To do	5482	17	7			
March	"	To do	3480	18	4			
April	"	To do	2594	9	8			
May	"	To do	4950	4	8			
June	"	To do	5959	5	11			
						37030	4	11
						£139293	16	11

CONSTRUCTION—4th Section.

1851.								
Nov.	30.—	To Balance,				£471	12	8
Dec.	"	To do	£1357	6	4			
1852.								
Jany.	"	To do	2011	18	8			
Feby.	"	To do	2413	18	4			
March	"	To do	2611	3	8			
April	"	To do	1061	13	6			
May	"	To do	2382	3	3			
June	"	To do	27043	5	4			
						38881	9	1
						£39353	1	9

EQUIPMENT.

1851.								
Nov.	30.—	Balance,				£39990	18	7
Dec.	"	do	£358	17	11			
Jany.	"	do	43	6	3			
Feby.	"	do	37	2	8			
		McLean & Wright,	5024	16	4			
		"Magog,"	2500	0	0			
						7964	3	2
						£47955	1	9

INCIDENTAL EXPENSES.

	£	s.	d.			
Office Expenses,	£107	0	5			
Advertising and Printing,	4	6	0			
Contingencies,	1692	5	4			
Interest,	1456	16	4			
Interest on Debentures,	1500	0	0			
Interest on City Bonds,	2250	0	0			
Do do	1500	0	0			
Incidental Expenses,	290	19	10			
Interest on Provincial Bonds,	£3700	0	0			
				£12501	7	11

Memorandum—Of the information required in reference to the St. Lawrence and Atlantic Railway, to enable the undersigned to report thereon in accordance with the instructions received from the Commissioners of Public Works,

1. A plan and profile of the Road as located, and on the scale now drawn—

The plan to shew the width of land taken from each lot, the name of the proprietor, the number, concession and Township or Parish. The profile to shew the cuts and fills on each division, the contour of the ground, the grade lines and the elevation of each change of grade above the datum line or tide water at Three Rivers.

Also, a general plan, on a small scale, shewing the connection of this Road with the Atlantic and St. Lawrence, the Island Pond Section, and the possible future connection with the Connecticut and Passumpsic Railroad, and the several trial lines, surveyed previously to making the final location.

2. A detailed tabular statement of the gradients, together with a summary of the same classified—a list of the courses, their radii and deflection—the length of each and the gradients upon which it occurs, and a summary of the same, classified according to their radii—a table of tangents, shewing the length of each, and a summary of tangents and courses, shewing the total length of Road to Province Line.

The detailed statement of grades to shew the length of each plane, its rate of ascent or descent per mile ; its total ascent or descent and the elevation of each change of grade above the datum line.

The summary of gradients to shew the number of miles of road, level and under 5 feet per mile, 5 to 10 feet, 10 to 20 feet, 20 to 30 feet, 30 to 40 feet, 40 to 50 feet, and 50 to 58 feet. (It is desirable to obtain the same, if possible, in reference to the Atlantic and St. Lawrence Road.)

(3.) A statement of the amount expended in the construction of this Road to the Province Line, on each division, up to 31st October, 1852, the estimated amount required to complete the same from that date, and the total cost thereof under the following heads :—

		Expended to 31st October, 1852.	Required to complete.	Total Cost.
1. Grading, including	Earth Excavation			
	Rock			
	Rip Rap Wall			
	Grubbing and Clearing			
2. Masonry and Foundation.	In Mortar			
	Dry Wall			
	Timber and Plank			
3. Bridging and Bridge Superstructure				
4. Fencing				
5. Building Stations, and Machine Shops				
6. Permanent Way,	Iron Rails, Chains and Spikes			
	Ties			
	Ballast			
	Laying Tract			
	Distribution of Iron			
7. Engineering				
8. Rolling Stock,	Locomotives for Freight			
	Do. Passengers			
	1st Class Passenger Cars			
	2nd do. do.			
	Mail and Baggage			
	Platform			
	Freight			
	Gravel Cars			
	Hand Cars			
	Snow Ploughs			
	Turn Tables			
	Machinery and Shops			
9. Right of Way				
10. Interest				
11. Discount				
12. Agencies				
13. Contingent Expenses,	Law Charges			
	Travelling Expenses			
	Salaries			
	Stationery and Printing			
	Other Expenses			

4. A financial statement of the ways and means by which the liabilities of the Company have been met, and of the resources from which it is proposed to complete the undertaking. This statement to include the gross amount realized from the Government Guarantee.

5. A statement of the force employed upon the Road on the 1st November, 1852. The probable period of completion of each division. The number of miles of tract laid and still to lay; do. of sidings do. The form of rail, and rate per lineal yard; the works from whence supplied, and price per ton delivered in Montreal.

The weight of chain wrought and cast—length and weight of spikes—the number and weight per mile.

The length, face and thickness of ties, and the kind of wood allowed to be used.

Number of Engine Houses and Shops, and the number of Station Houses and Water Tanks built and remaining to be built.

The total length of trussed bridging on the Road, classified according to their span.

A copy of the plan of Brompton Bridge.

A statement of the contract prices for the different classes of work on each station.

A copy of the general specification for grading and forming the Road.

The estimated cost of reducing the gradients west of the St. Francis to 45 feet per mile, to make them correspond with the maximum grade between Richmond and the Province Line.

(Signed,) SAMUEL KEEFER,
Chief Engineer, P. W.

Montreal, 6th November, 1852,

MONTREAL, *9th December*, 1852.

SIR,—I have the honor to represent, that after completing my out-door examination of the St. Lawrence and Atlantic Railroad, on the 4th ultimo, I called upon the officer of the Company to furnish me the information necessary to enable me to make up my Report in accordance with the Commissioner's instructions.

The whole of the information called for, has not yet been received, but I am this day furnished with the Company's financial statement, from which I beg to report the following results :—

The total expenditure upon the Road from Montreal to the Province line—a distance of 126—miles up to 31st Oct., 1852, is..	£986,201	3	5
The estimated cost of completion up to the opening of the entire Line is..	150,771	0	0
	£1,136,972	3	5
One half of this, the amount claimed by the Company for the Provincial Guarantee is........................	£586,486	1	8
Bonds have been drawn on account of the Company's claim for £400,000 sterling,..............................	486,666	13	4
Leaving a balance in currency	£81,819	8	4

Equal to £67,500 sterling, as the amount for which the Company may claim the Provincial Guarantee upon the full opening of the Road on the 1st August next, and for which provision must be made by a further issue of Bonds to that amount.

Subordinate to this, however, and in respect to their more immediate claim for the Provincial Guarantee up to the 31st October, it appears that—

The total expenditure up to that date was				£986,201	3	5
One half of which is				493,100	11	8
And on account of which the Company has received to same date	£409,666	13	4			
And on the 8th November last	25,000	0	0			
				434,666	13	4
Leaving,				£58,333	18	4

As the present amount of the Company's claim for Provincial aid on account of outlay already made upon the Road.

The Company claims the Guarantee upon the whole Road, 96 miles of which is in operation, and the remaining 30 miles well advanced and expected to be completed by 1st August next.

I am unable to report further upon the general characteristics of the Road, until I receive the balance of the information called for, and which is now expected every day.

I have only to add that, in reply to a Telegraph from the Hon. Inspector General, I have already sent him the result first stated, informing him that the balance of bonds to be issued to provide against the completion of the Road, will be £67,500 sterling.

My detailed and final Report will be sent as soon as it can possibly be completed after I have obtained all the necessary information.

I have the honor to be,
Sir,
Your most obedient servant.

(Signed,) SAMUEL KEEFER.
Chief Engineer, P. W.

Thomas A. Begly, Esq.,
Secretary Public Works,
Quebec.

Montreal, 18*th* *Dec.*, 1852.

Sir,—In compliance with your instructions from the Commissioners of Public Works, I have the honor to submit the following Report upon the St. Lawrence and Atlantic Railroad for their information:—

My examination of that Road was commenced on the 30th October last, and completed on the 4th ultimo; on my return to this City, I called upon the officers of the Company for the information detailed in the memorandum, a copy of which marked (A) is appended to this Report. It was not until the 9th instant that I received from the Secretary of the Company the financial statement called for in that memorandum; meanwhile, my attention was devoted to the prosecution of the survey for the Montreal and Kingston Railroad, and the various other matters which I had in hand for the Department, but immediately upon the receipt of this statement, I reported its results in order that there might be no delay on my part. Since then, having received the balance of the information called for (with the exception of the copies of the Plans and Profiles which it will occupy some considerable time to make, and which are not material to enable me to close this Report,) I shall now proceed to give the information called for by the Commissioners, and as required by law, adopting such an arrangement thereof as appears most convenient for reference.

Before entering, however, upon the various subjects of this Report, I beg to remark, that the Provincial aid having been already extended to this Road, after a previous examination and Report by the Honorable H. H. Killaly, by the issue of Bonds on account of it to the extent of £400,000 sterling, equal to £486,666 13s. 4d. currency, of which sum the Company has actually received up to the present time £434,666 13s. 4d., it does not appear to me that the question of granting such aid to the undertaking is one now to be considered otherwise than as respects the balance which the Company may fairly claim to receive upon the opening of the entire line.

1. The Location.

Portland being the nearest sea-port on the Atlantic to Montreal, it was manifestly the interest of the Company, having once selected that point on the Atlantic for the terminus of the through business, to endeavour to reach it by the shortest and most feasible line. How far their best interests have been promoted by the line selected, time will tell. In affecting a junction with the Atlantic and St. Lawrence Railway, a considerable detour has been made. The general bearing or direct course from Montreal to Portland is nearly 68 ° E. from the true meridian, and the distance by that line 203 miles; the direct line from Montreal to the point where the Road crosses the boundary line between Canada and the United States is 50 ° E., and the distance 92 miles. In reaching the latter point, the Road first takes the general direction 78° E., 72 miles to the River St. Francis, and thence up the St. Francis and the Coaticook on a general course of N. 18 ° E., 54½ miles to the boundary line, making the whole distance by rail 126½ miles, and exceeding the direct or "air" line by 34½ miles. The distance by rail to Portland is 290 miles, exceeding the air line by 87 miles.

The junction with the Atlantic and St. Lawrence Company does, however, take place at the line 45 °, but at a point 16 miles to the southward, at Island Pond. By an arrangement between the two Companies, the St. Lawrence and Atlantic Company is to build and operate this 16 miles of Road in the State of Vermont.

The work is in progress, and will be completed simultaneously with the portion in Canada; but, being without the Province, the Provincial Guarantee cannot of course be extended to it, and therefore I did not feel called upon to examine it or to take account of its cost in the Report now laid before the Commissioners.

The junction at Island Pond offers this advantage to the Canadian Road, that it may from thence connect both with Portland and Boston. The Connecticut and Pasumpsa Road is now completed to St. Johnsburg, in Vermont, within 30 miles of Island Pond.

The direct course from Montreal to Island Pond leads to the South of Lake Memphremagog, over ground, which is understood for the most part to be favorable. It is not at all unlikely that the shortest line will be occupied at some future day. In proportion as the through business in that direction of the Sea-coast increases, in the same degree will competition for it bring into use the shortest and more feasible lines.

The chief advantages of the location which has been made are, 1st, the securing of the important way traffic at St. Hyacinthe, Melbourne, Richmond, Sherbrooke and Lenoxville; and 2nd, that 72 miles of the Road, or more than half, is made common to the trunk line between Montreal and Quebec.

Before making the final location on the Western Bank of the Coaticook, I learn that several trial lines were surveyed, none of which afforded the same advantages as the one selected. The last nine miles nearest the line 45° is very expensive, from the heavy cutting required to carry the Road along the slope of the hill. From merely riding over the line, it appeared to me that the Road there might have occupied the valley and avoided much of this heavy cutting; but, without making a survey, it is impossible to speak with any confidence of the advantage which might result from the selection of such a line.

2. PROGRESS OF THE WORK.

The Road is now in operation from Montreal to Sherbrooke, a distance of 96 miles. The grading, masonry, &c., of the remaining 30½ miles to the Province line, is well advanced, and it is confidently expected that the whole will be completed and in operation by the 1st of August next,—excepting the ballasting of some portions, which can be finished to better advantage after the Road is in operation. By that time it is also expected that the Atlantic and St. Lawrence Road will be completed, and the whole line from Montreal to Portland will then be brought into use.

The force employed upon the Road up to the 1st November, consisted of 2347 men, and 483 horses and carts.

There had been laid 98 miles of single track and 6 miles of sidings, and there remain 28½ miles of single track and 4 miles of sidings yet to be laid.

As the Provincial Guarantee by the Act 14 and 15 Vic., cap. 73, Sec. 24, extends to the equipment of the Road, I may add that the rolling stock now provided and that which has been contracted for against the opening of the entire line, is as follows:—

LOCOMOTIVE ENGINES.

13	first class locomotives on the Road, and 9 contracted for—Total,	22
2	second ditto,	2
15	locomotives in use—9 contracted for—Total,	24

CARS.

7	first class Passengers' Cars	in use—	3	contracted for—	Total,	10
2	second do.	do.	5	do.	do.	7
2	Baggage Cars	do.	2	do.	do.	4
	Express Cars	do.	3	do.	do.	3
23	Covered House	do.	120	do.	do.	143
93	Platform Cars	do.	90	do.	do.	183
127	Cars in use.		223	contracted for—	Total,	350

Engine-houses and stations have been built at Longueuil, Richmond and Sherbrooke; one workshop at Longueuil, 3 way stations and tanks built, and 5 more yet to build; wood sheds and freight sheds have been erected at different places along the line, and a temporary shed for stowing goods on the wharf at Longueuil.

3. CHARACTERISTICS OF THE ROAD.

This Road has the Provincial Guage of 5 feet 6 inches between the rails, corresponding with the guage adopted by the Atlantic and St. Lawrence Rail-road Company, but differing from all other connecting or competing lines leading towards Boston and New York.

It has been graded, generally, for a single track, but all the bridge abutments and larger culverts have been built for a double track, and in a permanent manner.

It will have ten miles, or about 8 per cent of sidings; throughout the level Country the track is generally well elevated so as to be above the snow in winter.

The maximum grade going eastward in the direction of the greatest traffic, is 58 feet per mile, but this is limited to one plane westward of the St. Francis. The maximum grade in the same direction eastward of the St. Francis, does not exceed 45 feet to a mile. The maximum grade going west is also 58 feet per mile, but limited to the summit west to the St. Francis.

The minimum radius of curvature is 1146 feet. The line westward of the St. Francis is very direct, and has few curves, while from the nature of the location along the banks of the St. Francis and the Coaticook the curvature is very considerable.

The following table exhibits the comparative grades and curves upon the different portions of the Provincial Trnnk Line, and other connecting Roads as nearly as the progress of the works or the surveys will admit of.

NAME OF ROAD.	Length in Miles.	Max. grade ascending, in feet, per Mile.		Min. radius of Curvature in feet.
		In direction of greatest traffic.	In direction of least traffic.	
1. Great Western, Niagara River to Hamilton	42¼	39	19	2865
Hamilton to Windsor	186¼	30	50	1496
2. Toronto and Guelph	47½	36	53	3820
3. Ontario, Simcoe and Lake Huron	100	53	60	1496
4. Main Trunk—Toronto to Kingston	165	26½	40	2865
Kingston to Montreal	178	26½	40	2865
5. St. Lawrence and Atlantic	126½	58	58	1146
6. Quebec and Richmond	100			
7. Atlantic and St. Lawrence 147¾ St. Lawrence and Atlantic Island Pond ... 15¾	163½	45	60	955
8. Bytown and Prescott				

From the accompanying statement of gradients marked (C), furnished by the Company's Engineer, it is worthy of notice that fully one-third of the whole Road is level; that the grades of 45 feet per mile and under (including the level portions) amount to 82 per cent., and that those exceeding 45 feet per mile are only 18 per cent. of the whole distance of the Province Line.

The grades of 58 feet per mile ascending eastward, is situated in the Township of Durham, on a spur of the range of hills west of St. Francis. This plane is 6,900 feet in length, but is immediately connected with three other ascending planes of 46, 52, and 54 feet per mile, altogether extending over a distance of nearly five miles, with only an intervening level run of 1,500 feet. The effect of these grades is to limit the load which a locomotive can draw, and consequently to increase to a certain extent the transportation; and although it may not be expedient or advisable at the present time to incur the expense of reducing them to a par with the rest of the Road (estimated by the Engineer to cost £20,000 for a grade of 45 feet per mile), yet there is every likelihood that the establishment of an extensive through business will ultimately demand it. They were adopted at a time when, from all previous surveys, it was supposed impossible to pass the summit with grades of less than 60 feet per mile, and before the survey by the Western Coaticook had shewn that grades as low as 45 feet per mile could be obtained.

It is also to be remarked that going from Montreal towards the sea, the ascending grades are 59 miles in extent, the descending grades 25½ miles, and the level parts nearly 42 miles.

The first summit West of the St. Francis is in Durham, and is 582.67 feet above the St. Lawrence.

The next summit is at the boundary line 1221.79 feet above the St. Lawrence. The summit of the Island Pond section in the state of Vermont is 1350 feet above the same level.

As regards alignment, it may be observed from the statement of curves marked (D) that of the whole distance to the Province line, 94 miles are straight and 32½ miles curved, and the curvature in the aggregate amounts to 3768 degrees of deflection.

All the larger Bridges are constructed upon the "*Howe Truss*" principle without arcs. The spans vary in extent from 50 to 174 feet, altogether there are 4011 feet of Bridging on this Road, which is equal to 1⅝ per cent. of its entire length. Engineers are still divided in opinion with respect to the best plan to be adopted for wooden Bridges. Several different systems have been tried. There are Town's lattice Bridge, Major Long's Truss, Howe's Truss, with and without arc, Burr's Arch and Truss, and latterly McAllum's Truss. Up to this period, practice seems mostly divided—between Howe's and Burr's; the former is generally adopted throughout New England, where it first originated, and the latter is altogether preferred throughout Pennsylvania, in which State are numerous fine examples of this system.

The Bridges on this road have been in use for some considerable time, sufficient certainly to test their qualities; so far, they have answered well. They require adjustment occasionally, and, as business increases, I think it will be advisable to give them the auxiliary support of an arc. In the case of the Brompton Bridge, especially, the span of which was originally 184 feet, but lately reduced to 174 feet, I should consider the arc indispensible, and would recommend it to be put on immediately. It would be advisable to cover all the larger Bridges to protect them against the influence of the weather, and from accident by fire.

The piers and abutments of all the larger Bridges are built of solid masonry laid in common lime mortar. No cement has been used. The smaller culverts are laid dry without any mortar.

For single track, the road is graded 15 feet wide in embankments, and 22 feet in excavations. The slopes are generally one and a-half foot base to one foot rise; ballasting, 2 feet in depth; cross ties, 9 feet long, and not less than 6 × 8 inches, laid 30 inches apart from centre to centre. Tamarack, cedar, hemlock, and some black ash ties have been used.

The Road has been furnished with the Bridge rail, weighing 63 lbs. to the lineal yard, and for the most part with wrought iron chairs, weighing 13 lb. each. The rails have been furnished by the Coalbrooke-dale and Ebbwoall Companies, and are of good quality. The cost from £8 2s. 6d. to £12 per ton, delivered at Montreal.

4th.—*Quality of Work.*

The masonry of the Piers and abutments of all the larger Bridges as well as all the larger culverts, as before stated, is laid in common lime mortar; it is generally of a good substantial character, plain and without pretension to display, just what might be considered suitable for the occasion. It would perhaps have been better had the joints of theface stones, for a depth of 6 to 9 inches, been laid in hydraulic cement, as it would have prevented the action of the water from affecting the face of the walls, but the expense of transporting this material along the line, was considered an objection.

All the square box culverts are laid up dry without the use of mortar. In most parts of the country, particularly along the Coaticook, the material for making a dry wall is not good, and consequently these culverts are inferior to similar works on other Roads, where better material is found. From being for the most part situated upon a side hill, they are more exposed to accidents; this is one of the most objectionable features in the character of the unopened parts of this Road, but if the difficulty of procuring and transporting good material to make a better class of work be taken into account, the extra expense would scarcely be warranted, particularly as such culverts are not generally placed under high banks, when their removal in case of accident would be a matter of serious moment.

The workmanship of the wooden Bridges is generally of a good character.

The Engine Houses and Stations at Longueuil and St. Hyacinthe, are plain brick buildings, but those at Sherbrooke, though built of the same material, have a much better appearance, and are much more suitable to the character of a Provincial Road.

Upon the whole therefore, I see nothing either in the character or quality of the work, to disqualify the Company from receiving the benefit of Provincial aid, as provided by Law. The expenditure in construction appears to have been regulated by a prudent economy, and while intending to make a good permanent Road, with suitable and sufficient structures, nothing has been spent unnecessarily in expensive modes of building. The amount to which they may be entitled to receive the Provincial Guarantee may now be considered.

5TH.—*The cost of the Road.*

According to the official Returns furnished me by the Secretary, (see statement B. annexed,) it appears that the amount expended up to the 31st October, 1852, upon the construction of the Road from Montreal to the Province Line, including land, buildings, equipments, engineering, interest, discount and contingencies,

was	£986,201	3	5
The amount required to complete the Road up to the opening of it, is estimated at	150,771	0	0
Total,	£1,136,972	3	5

which is equal to £8,988 per mile.

From the manner in which the accounts have been kept, the Secretary is unable at present to furnish me with the detailed cost of the several divisions in the manner called for in my memorandum marked (A,) but from his statement, marked B., I have compiled the following abstract, which I apprehend will be sufficient to satisfy the Railway Board in regard to the information required to determine the amount of Guarantee to which the Company may be entitled by Law.

Section No. 1,	extends from	Longueuil to St. Hyacinthe,......	30 miles.
" " 2,	" "	St. Hyacinthe to Richmond,...	42 "
" " 3,	" "	Richmond to Sherbrooke,......	24 "
" " 4,	" "	Sherbrooke to Province Line,...	30½ "
		Total,	126½ miles.

ABSTRACT of Statement furnished by the Secretary.

Heads of Expenditure.			Expended to 31st October, 1852. £	s.	d.	Amount required to complete. £	s.	d.	Total Cost. £	s.	d.
For grading, masonry, Bridging, Superstructure and Permanent way,......	Sec. 1....	30 m.	165756	15	5	5150	0	0	170906	15	5
	" 2....	42 "	277416	15	1	7040	0	0	284456	15	1
	" 3....	24 "	154627	4	9	4150	0	0	158777	4	9
	" 4....	30½ "	155174	4	6	67156	0	0	222330	4	6
Total................		126½	752974	19	9	83496	0	0	836470	19	9
Building machinery and wharves.											
Lands and Stations.											
Fencing.											
Rolling Stock.											
Locomotives................ £30296 9 2											
Passenger Cars............ 4174 12 2											
Freight and Platform........ 25846 18 11			£	s.	d.	£	s.	d.			
Snow Ploughs.............. 317 1 5			60634	19	6	60000	0	0	120634	19	6
Engineering.			27589	4	10	....			27589	4	10
Interest and discount.			61475	16	0	....			61475	16	0
Contingencies.			18984	12	4	....			18984	12	4
			986201	3	5	175771	0	0	1161972	3	5
Deduct the cost of works which cannot be executed until after the opening of the Road.			....			25000	0	0	25000	0	0
Totals................£			986201	3	5	150771	0	0	1136972	3	5

6TH.—AMOUNT OF PROVINCIAL GUARANTEE.

From the present condition of the works, I have no doubt it will require the whole of the Estimate of £150,771 to get the Road in operation, and it is to be observed that, in making up this Estimate there does not appear any allowance for Engineering, Interest, Discount or Contingencies. The whole of the work is under contract at fair and reasonable prices; see annexed statement, marked (E).

The Directors claim the Guarantee upon the whole Road, half its cost when completed will be £568,486 1 8

I learn that Guaranteed Bonds have been issued on account of this work to the amount of £400,000 sterling, equal to 486,666 13 4

Leaving a balance in currency .... £ 81,819 8 4

equal to £67,500 sterling, as the amount which the Company may claim to receive the Provincial Guarantee, upon the full opening of the Road on the 1st August next, and for which it may be necessary to make immediate provision by a further issue of guaranteed Bonds to that amount.

In respect, however, to the more immediate claim of the Company for the guarantee upon the half of their actual expenditure, up to the 31st October last, it appears from their Statements that their total outlay up to that date was £986,201 3 5

One-half this amount is £493,100 11 8

On account of which they have received up to the same date the sum of £409,666 13 4

And on the 8th November last 25,000 0 0, 434,666 13 4

Leaving currency,................ £58,433 18 4 as the present amount of the Company's claim for Provincial aid on account of outlay already made upon the Road.

The land for the Road has all been acquired and paid for as far as practicable. From the difficulty in a few instances of obtaining titles, there is still a balance of about £2,500 to be paid on this account.

The total amount of Provincial Guarantee claimed by the Company, as before stated, is £568,486 1s. 8d. currency, which is equal to £4,494 per mile. Upon obtaining this amount the construction account of this Road will probably be closed, and all other expenditure thereafter must be charged against revenue.

In view of the interest which the Province has in this Road in common with the Stockholders, I beg, before closing this Report, to offer a few remarks upon the position, in which it appears to me, it will be found when opened for business next summer.

While extensive preparation have been made at Portland for receiving and storing wheat, flour, and other articles of freight expected to be transported over this Road, there is at Longueuil nothing more than a temporary shed which has to be removed every winter, and a wharf terminating in 6 feet water, alongside of which no large sized and well laden vessel can find a berth. The necessity for more wharf and storage accommodation is apparent upon the least reflection, and is a subject which demands immediate and serious attention. It will be found to be affected by the other Railroads centering in Montreal, by the harbor and dock improvements, and by the projected bridge in front of the City.

Again the maximum gradient of 58 feet per mile, overcoming the intermediate summit west of St Francis is an objectionable feature which ought to be removed. If this ascent were reduced to 45 feet per mile, it would greatly improve the character of the Road, and place it on a par with its connecting line to Portland. No heavier gradient than 45 feet per mile would then oppose a load going towards tide water.

And lastly, the suggestions made in regard to the bridges, in the former part of this Report, may be considered worthy the attention of the Railway Board. The Documents marked F, G and H, attached to this Report, may be found useful for future reference.

All of which is nevertheless most respectfully submitted for the consideration of the Commissioners, by

Sir,
Your very obedient servant,
(Signed,) SAMUEL KEEFER,
Chf. Engr. P. Works.

Thos. A. Begly, Esquire,
Secretary Public Works,
Quebec.

21*st December*, 1852.

P. S. Upon further reference to the Official Returns, while engaged in making out the foregoing Report, I perceived that the cost of the Road per mile, exclusive of engineering, discount, interest and contingences, would amount to £8,133, according to the Engineer's Estimate. Having previously learned that a contract had been entered into with Messrs. Blackwood, & Co. for the whole Road, at a price per mile much below this Estimate. I addressed a letter to the Secretary on the 17th instant, a copy of which is transmitted herewith, in order to learn the conditions of the contract, and to ascertain the reasons which induced the Directors to release the Contractors from their obligations, but up to this time have not been favored with an answer. I have kept back this Report as long as possible in hopes of receiving one; but, knowing the anxiety of the Railway Board to obtain my Report, I am at last obliged to send it without these explanations. They shall be forwarded, however, as soon as received.

SAMUEL KEEFER.

(A.)

Memorandum of the information required in reference to the St. Lawrence and Atlantic Railway to enable the undersigned to report thereon in accordance with the instructions received from the Commissioners of Public Works.

(1.) A plan and profile of the Road as located and on the scale as now drawn. The plan to show the width of land taken from each lot, the name of the Proprietor, the number, Concession, and Township or Parish. The profile to show the cuts and fills on each division, the contour of the ground, the grade lines and the deviation of each change of grade above the datum line or tide water at Three Rivers.

Also, a general plan on a small scale, shewing the connexion of this Road with the Atlantic and the St. Lawrence, the Island Pond section, the possible future connexion with the Connecticut and Passumsic Railroad, and the several trial lines surveyed previously to making the final location.

(2.) A detailed tabular statement of the gradients, together with a summary of the same, classified; a list of the curves, their radii and deflections, the length of each and the gradient upon which it occurs, and a summary of the same classified according to their radii; a table of tangents shewing the length of each, and a summary of tangents and curves showing the total length of road to the Province line.

The detailed statements of grades to show the length of each place, its rate of ascent or descent per mile, its total ascent or descent, and the elevation of each change of grade above the datum line.

The summary of gradients to show the number of miles of Road, level and under 5 feet per mile, 5 to 10 feet, 20 to 30 feet, 30 to 40 feet, 40 to 50 feet, and 50 to 58 feet (it is desirable to obtain the same, if possible, in reference to the Atlantic and St. Lawrence Road.)

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(3). A **Statement** of the amount expended in the construction of the Road to the Province Line, on each Division, up to the 31st October, 1852, the estimated amount required to complete the same from that date, and the total cost thereof, under the following heads :—

		Expended to 31st October, 1852.	Required to complete.	Total Cost.
1. Grading, including	Earth Excavation			
	Rock			
	Rip Rap Wall			
	Grubbing and Clearing			
2. Dry Masonry and Foundation.	In Mortar			
	Dry Wall			
	Timber and Plank			
3. Bridging and Bridge Superstructure				
4. Fencing				
5. Building Stations, and Machine Shops				
6. Permanent Way,	Iron Rails, Chairs and Spikes.			
	Ties			
	Ballast			
	Laying Tract			
	Distribution of Iron			
7. Engineering				
8. Rolling Stock,	Locomotives for Freight			
	Do. Passengers			
	1st Class Passenger Cars			
	2nd do. do.			
	Mail and Baggage			
	Platform			

(3.) STATEMENT of the amount expended in the construction of Roads to the Province Line, &c.—(*Continued.*)

		Expended to 31st October, 1852	Required to complete.	Total Cost.
	Freight			
	Gravel Cars			
	Hand Cars			
	Snow Ploughs			
	Turn Tables			
	Machinery and Shops			
9. Right of Way				
10. Interest				
11. Discount				
12. Agencies				
13. Contingent Expenses,	Law Charges			
	Travelling Expenses			
	Salaries			
	Stationery and Printing			
	Other Expenses			

(4) A financial statement of the ways and means by which the liabilities of the Company have been met, and of the resources from which it is proposed to complete the undertaking. This statement to include the gross amount realized from the Government Guarantee.

(5.) A statement of the force employed upon the Road on the 1st of November, 1852—the probable period of completion of each division.

The number of miles of track laid and still to lay.

Do., do., of sidings do.

The form of Rail and weight per lineal yard, the works from whence supplied, and price per ton, delivered in Montreal.

The weight of chairs, wrought and cast, length and weight of spikes, the number and weight per mile.

The length, face, and thickness of ties, and the kinds of wood allowed to be used.

Number of Engine houses and shops, and the number of station-houses and water-tanks built, and remaining to be built.

The total length of truss bridging on the Road, classified according to their spans; a copy of the plan of Brompton Bridge.

A statement of the contract prices for the different classes of work on each section.

A copy of the general specification for grading and forming the road.

The estimate cost of reducing the gradients West of the St. Francis to 45 feet per mile, to make them correspond with the maximum grade between Richmond and Province Line.

(Signed,) SAMUEL KEEFER,
Chief Engineer P. W.

Montreal, 6th November, 1852.

(B.)

SAINT LAWRENCE AND ATLANTIC RAILROAD,
MONTREAL, *9th December*, 1852.

SIR,—With the object of meeting your requisition for information as to the actual cost of the work, executed on the Company's Railway, and the estimate cost of the work remaining to be executed to render the undertaking complete.

I beg now to furnish the following Statement:

The amount expended up to the 31st October last, in payment of the Grading, masonry and foundations, bridging and bridge superstructure, and permanent way is according to the annexed papers, 1, 2, 3, 4:—

For the 1st Section,	£165,756	15	5
" " 2nd "	277,416	15	1
" " 3rd "	154,627	4	9
" " 4th "	155,174	4	6
Total,	£752,974	19	9
The Building and Machinery, including the Wharves ...	41,214	13	7
The Lands and Stations,	18,876	3	3
The fencing,	4,430	14	2

ROLLING STOCK.

Locomotives,	30,296	7	2			
Passenger Carriages,	4,174	12	0			
Freight and Platform,	25,846	18	11			
Snow Ploughs,	317	1	5,			
				60,634	19	6
The Engineering,				£27,589	4	10
The Interest and Discount,	£61,475	16	0			
The Contingencies,	18,984	12	4			
				80,460	8	4
Total expenditure on Railway and Equipments,				£986,201	3	5

The resources, from which the Company has realized funds to meet this expenditure are shewn by the annexed paper, marked B 5.

The estimated cost of the works remaining to be executed in completion of the Railway and its full equipment, up to the date at which it is proposed to open it for traffic between the St. Lawrence and Atlantic, is shewn by the papers already referred to, 1, 2, 3, 4, to be as follows:

1st Section,	£ 5,150	0	0
2nd "	7,040	0	0
3rd "	4,150	0	0
4th "	67,156	0	0
Buildings and Machinery,	16,075	0	0
Lands and Stations,	2,500	0	0
Fencing,	13,700	0	0
	£115,771	0	0
Of these works, however, a portion estimated at about ...	25,000	0	0
Cannnot be executed until after the opening of the line.			
Leaving	£90,771	0	0

As the amount required for expenditure.

Expenditure up to 1st August next,

Brought over			90,771 0 0
The estimated cost of the equipment now in preparation is			60,000 0 0
Making a total of			£150,771 0 0

as the estimated cost of works yet incomplete.

The payments which may be made under the heads of Interest, Engineering and Contingencies it is proposed to meet from the Receipts of the Road in operation.

The total Expenditure up to 31st October, is			£986,201 3 5
One half of this amount is		£493,100 11 8	
On account of which the Company has received up to 31st October	£409,666 13 4		
And on 8th November last	25,000 0 0		
		434,666 13 4	
Leaving a balance of,		£58,433 18 4	

as the amount of the Company's claim for Provincial aid on account of the outlay made.

The total expenditure to 31st October,			£986,201 3 5
with the estimate cost of incomplete works			150,771 0 0
Will form a total ultimate cost of up the to the opening of the Line.			£1136,972 3 5
One half of this sum is,		£568,486 1 8	
The Provincial Guarantee Bonds drawn on account of the Company's claim amount to £400,000 sterling which at 24s. 4d., is		486,666 13 4	
Leaving in currency,		£81,819 8 4	
or sterling, about	£67,500 0 0		
The estimate of the works required to be completed is			£150,771 0 0
The balance of the outstanding liabilities of the Company on account of works executed is stated at,		£84,000 0 0	
Since reduced by receipt on 8th November,		25,000 0 0	
			59,000 0 0
			£209,771 0 0
To meet this expenditure the Company propose to appropriate the balance of the claim for work done corresponding nearly to the balance remaining of the proceeds of Provincial Guarantee Bonds already issued, which is		52,083 6 8	
And to negotiate a loan on Bonds of £60,000 sterling, the proceeds of which will amount to about		75,000 0 0	
Together making		£127,083 6 8	
The further amount of Provincial Guarantee Bonds to which the Company will be ultimately entitled, is shewn to be about £67,500 sterling, or in currency,		81,819 8 4	
			208,902 15 0

The remaining information which you require, is supplied by the Chief Engineer, as it comes specially within his Department.

I remain, Sir,
Your most obedient servant,
(Signed,) A. C. WEBSTER. Secretary.

B1.

Statement shewing the quantities and cost of work done, and also the quantities of work remaining to be done, and the estimated cost at the 31st October, 1852, on the 1st Division of the St. Lawrence and Atlantic Railway, extending from Terminus at Longueuil to St. Hyacinthe, a distance of 30 miles.

Description of Work.	Total quantities of Work done up to 31st October, 1852.	Cost.	Estimated quantity of Work remaining to be done to complete Road.
Grubbing and Clearing	30 acres,	£165,756 15 5	
Earth Excavation, Road Bed, including haul	887,432 cubic yards,		40,000 cub. yds.
Loose Rock Excavation do.	2,230 do.		
Solid do. do.	4,300 do.		
Earth Excavation, Foundations of Culverts	9,200 do.		
Solid Rock Excavation, do. do.	360 do.		
Do. do. Foundations, Bridge Abutments	1,190 do.		
Bridge Superstructure	1,015 lineal feet,		
Masonry in Foundations	215 cubic yards,		
Do. in Culverts, dry	4,040 do.		
Do. Arched Culverts, cemented	688 do.		
Upright supporting wall	662 do.		
Timber in Culverts	53.941 feet B. M.		
Plank in do.	76,504 feet.		
Timber in Bridges	495,088 do.		£5,150 0 0
Plank in do.	314,501 do.		
Lineal feet of longitudinal Track Timber	322,167 lineal feet,		
Cross Ties	43,214 Ties,		
Bridge Masonry	5,019 yards,		
Stone filling around Cribs	3,425 do.		
Timber in Cribs and Foundations	234,640 feet B. M.,		
Ballasting	122,048 yards,	...	60,000 cubic yards.
Iron	3,300 tons,		
Chairs	100 do.	...	10 tons.
Spikes	66 do.	...	6 do.
Frogs and Switches	20 sett,	...	15 setts.
Laying Track	33 Miles,	...	3 miles.
Snow Fences	...	...	5,000 feet.

B2.

Statement shewing the quantities and cost of work done, and the quantities of work remaining to be done, and the estimated cost thereof, at the 31st October, 1852, on the 2nd Division of the St. Lawrence and Atlantic Railway, extending from St. Hyacinthe to the Station at Richmond, a distance of 42 miles.

Description of Work.	Total quantities of Work done up to 31st October, 1852.	Cost, Currency.	Estimated quantity of Work remaining to be done to complete the Road.
Grubbing and Clearing	824 acres,	£277,415 16 1	
Earth Excavation in Road Bed	1,402,456 L. yards,		
Loose Rock Excavation	5,673 do.		
Solid do.	63,314 do.		
Slate do.	2,205 do.		
Earth Excavation in foundation	19,057 do.		
Bridge Masonry	15,371 d0.		
Masonry in Foundations	1,869 do.		
Box Culverts, Masonry, dry	2,001 do.		
Do. do. lime	4,132 do.		
Rip Rap Wall	6,540 do.		
Timber in Culvert Foundations	145,800 feet B. M.		
Plank in do. do.	70,956 do.		£7040 0 0
Timber in Bridges and Crossings	348,847 do.		
Plank in do. do.	86,373 do.		
Superstructure of Bridges	1,367 lineal feet,		
Cross Ties	105,666 ties,		
Ballasting	73,626 L. yards,	...	100,000 L. yards.
Laying in Track, including Sidings	44 miles,	...	2 miles.
Making Public Road and altering Channel of Streams			
Iron	4,400 tons,	...	150 tons.
Spikes	88 do.	...	6 do.
Chairs	132 do.	...	4 do.
Frogs and Switches	30 setts.	...	10 setts.

B3.

Statement shewing the quantities and cost of work done, and the quantities of work remaining to be done, and the estimated cost thereof, at the 31st October, 1852, on the 3rd Division of the St. Lawrence and Atlantic Railway, extending from Richmond to the Station at Sherbrooke, a distance of 24 miles.

Description of Work.	Total quantities of work done up to 31st October, 1852.	Cost.	Estimated quantity of work remaining to be done to complete the Road.
Grubbing and Clearing	225¾ acres,		
Earth Excavation in Road Bed	1,072,482 cubic yards,	... ...	36,000 cubic yards.
Loose Rock Excavation	9,454 do.		
Solid do.	71,321 do.		
Slate do.	1,880 do.		
Earth Excavation in Foundation	17,449 do.		
Rock do. do.	739 do.		
Bridge Masonry	7,310 do. ...	... ...	300 cubic yards.
Masonry in Foundations	2,812 do.		
Box Culverts, Masonry, dry	6,907 do.		
Do. in lime	2,224 do.		
Rip Rap Wall	56,732 do.		
Timber in Culvert Foundations	116,495 feet, B. M.,	£154,627 4 9	£4150 0 0
Plank in do. do.	19,254 do.		
Timber in Bridges and Crossings	86,184 do.		
Plank in do. do.	15,620 do.		
Superstructure in Bridges	708 lineal feet,		
Cross Ties	50,081 ties,		
Upright supporting Wall	1,385 C. yards,		
Ballasting	24,378 do. ...	... ...	60,000 cubic yards.
Laying Track, including Sidings	24 miles,		
Making Public Roads			
Iron	2,500 tons,		
Spikes	50 do.		
Chairs	75 do.		
Frogs and Switches	10 setts,		

B4.

Statement shewing the quantities and cost of work done, also the quantities of work remaining to be done, and the estimated cost thereof, at the 31st October, 1852, on the 4th Division of the St. Lawrence and Atlantic Railway, extending from Sherbrooke to the Boundary Line of the Province of Canada and State of Vermont, a distance of 30 miles.

Description of Work.	Total quantities of work done up to 31st October, 1852.	Cost.	Estimated quantity remaining to be done to complete the Road.
Grubbing and Clearing	438 acres,		
Earth Excavation in Road Bed	1,565,010 C. yards, ...	... ...	564,000 C. yards.
Loose Rock Excavation, including haul	10,030 do. ...	... ...	1,500 do.
Solid do. do. do.	75,461 do. ...	... ...	31,000 do.
Slate do. do. do.			
Earth Excavation in Foundations	35,749 do.		
Rock Excavation	938 do.		
Bridge Masonry	6,056 do. ...	... ...	1,800 do.
Masonry in Foundations	5,724 do.		
Arched Culverts, Masonry, dry	291 do.		
Do. in lime	7,978 do. ...	... ...	500 do.
Box Culverts, Masonry, dry	18,737 do. ...	... ...	5,000 do.
Do. in lime	2,074 do.		
Rip Rap Wall	8,971 do. ...	... ...	1,250 do.
Timber in Culvert Foundation	551,943 feet, B. M.,	£155,174 4 6	£67,156 0 0
Plank in do. do.	124,152 do.		
Timber in Bridges and Crossings	45,302 do.		
Plank in do. do.	9,981 do.		
Superstructure of Bridges	... ...	... ...	470 C. feet.
Cross Ties	8,816 ties, ...	... ...	60,000 ties.
Upright supporting Wall	116 C. yards,		
Laying Track, including Sidings	2 miles, ...	... ...	30 miles.
Making Public Road			
Iron	3,400 tons,		
Spikes	... ...	... ...	64 tons.
Chairs	... ...	... ...	99 do.
Frogs and Switches	... ...	... ...	30 sett.
Ballasting	... ...	... ...	160,000 C. yards.

B5.

THE RESOURCES from whence have proceeded the funds for payment of the cost of the Road Work executed to the 31st October, 1852, are :—

		£	s.	d.	£	s.	d.
Shares subscribed		353,175	0	0			
Referential Stock		125,000	0	0			
Forfeited		8,039	1	0			
		£486,214	1	0			
Less.							
Outstanding Instalments	£32,621 13 3						
Bills received	11,667 18 10						
		44,289	12	1			
					£441,924	8	11
Loans					50,000	0	0
Her Majesty's Government—£275,000 Stg., at 24s. 4d.		£334,666	13	4			
3 Instalments of £25,000 each		75,000	0	0			
					£409,666	13	4
					£901,591	2	3
Bills and Accounts outstanding—Balance					84,610	1	2
					£986,201	3	5

(C.)

STATEMENT of Gradients on the several Divisions of the St. Lawrence and Atlantic Railroad, commencing at Longueuil and ending at Boundary Line.

	Nature of Grade.	Length in feet.		Nature of Grade.	Length in feet.
	First Division.			1st *Division—Continued.*	
	Level.	1500 feet.	A	4.01 " "	7900 feet.
A	2.92 feet per mile.	1200 "	D	1 53 " "	6900 "
A	40.02 " "	5700 "	A	3.77 " "	2800 "
A	8.01 " "	5800 "	D	1.81 " "	6700 "
D	7.63 " "	1800 "	D	9.65 " "	2600 "
A	19.73 " "	3800 "		Level.	5000 "
D	9.66 " "	3500 "	D	2.64 " "	2000 "
	Level.	2700 "		Level.	3200 "
D	6.00 " "	7000 "			
	Level.	7100 "			159,200 feet, or 30 miles, 800 feet.
A	6.77 " "	3900 "			
	Level.	8000 "		*Second Division.*	
D	30.88 " "	5300 "		Level.	600 feet.
	9.09 " "	2300 "	D	30 feet per mile.	800 "
D	8.88 " "	4400 "		Level.	1060 "
	0.02 " "	8600 "	D	25 " "	1640 "
D	12.75 " "	4600 "	A	20 " "	3900 "
	Level.	3900 "		Level.	3000 "
A	19.80 " "	1600 "	A	5 " "	6500 "
	Level.	1300 "	A	35 " "	4500 "
A	28.43 " "	13000 "	A	38 " "	9300 "
	Level.	1000 "		Level.	3900 "
D	4.40 " "	2400 "	A	26 " "	5100 "
A	15.40 " "	2400 "	A	12 " "	2700 "
D	0.85 " "	6200 "	A	35 " "	3000 "
D	10.92 " "	2900 "	A	45 " "	2800 "
D	30.91 " "	4100 "		Level.	700 "
	Level.	500 "	D	10 " "	2000 "
A	27.45 " "	2500 "	A	20 " "	2000 "
	Level.	3100 "		Level.	1700 "

(C.)

STATEMENT of Gradients on the several Divisions of the St Lawrence and Atlantic Railroad, &c.—(*Continued.*)

	Nature of Grade.	Length in feet.		Nature of Grade.	Length in feet.
D	45 feet per mile.	8500 feet.		*3rd Division—Continued.*	
	Level.	2300 "		Level.	7400 "
D	16 " "	4800 "	A	21 " "	3000 "
	Level.	1500 "	D	8 " "	2000 "
A	14 " "	2800 "	D	12 " "	1300 "
	Level.	1200 "		Level.	12700 "
A	15 " "	7000 "	A	32 " "	2600 "
	Level.	7600 "		Level.	600 "
A	25 " "	5500 "	A	20 " "	10200 "
A	38 " "	3300 "		Level.	17600 "
A	40 " "	4300 "	A	9 " "	4000 "
	Level.	600 "	D	07.34 " "	7000 "
A	27 " "	3500 "		Level.	1400 "
	Level.	500 "	D	15 " "	1100 "
D	20 " "	1500 "		Level.	4600 "
A	16 " "	5100 "			127,000 feet, or 24 miles, 380 feet.
A	45 " "	4600 "			
	Level.	700 "		*Fourth Division.*	
D	42 " "	3300 "	A	20 feet per mile.	3400 feet.
	Level.	5200 "		Level.	8600 "
A	10 " "	2600 "	D	5 " "	1700 "
	Level.	1700 "		Level.	7200 "
A	16 " "	3400 "	A	35 " "	2800 "
A	54 " "	6800 "		Level.	1700 "
	Level.	1500 "	A	40 " "	2100 "
A	52 " "	4000 "		Level.	2800 "
A	46 " "	6700 "	A	44 " "	2600 "
A	58 "	6900 "	A	17 " "	3900 "
	Level.	3100 "	A	45 " "	9400 "
D	10 " "	2000 "		Level.	4600 "
A	20 " "	2000 "	A	40 " "	3100 "
	Level.	1700 "		Level.	1500 "
D	58 " "	7800 "	A	40 " "	2700 "
	Level.	3200 "		Level.	2400 "
D	20 " "	1300 "	A	45 " "	5400 "
	Level.	9000 "	D	30 " "	2600 "
A	38 " "	2100 "		Level.	800 "
D	12 " "	2600 "	A	30 " "	1000 "
	Level.	3300 "	A	45 " "	5600 "
D	56 " "	10300 "	A	40 " "	2000 "
	Level.	1700 "	A	45 " "	20800 "
D	28 " "	6600 "		Level.	1700 "
	Level.	4400 "	A	45 " "	2700 "
A	13 " "	2000 "	A	22 " "	4200 "
	Level.	2000 "		Level.	3100 "
			A	40 " "	4100 "
		222,000 feet, or 42 miles, 240 feet.		Level.	3800 "
			A	45 " "	4600 "
	Third Division.		A	15 " "	4000 "
	Level.	1000 feet.	A	40 " "	3400 "
A	5 feet per mile.	7000 "	A	20 " "	3500 "
	Level.	5000 "		Level.	4100 "
A	7 " "	5000 "	A	35 " "	4300 "
	Level.	2700 "	A	45 " "	3100 "
A	10 " "	4500 "	A	33 " "	1800 "
D	8 " "	3000 "	A	45 " "	2000 "
	Level	2800 "		Level.	4700 "
D	9 feet per mile.	2200 "	A	45 " "	5000 "
A	14 " "	2400 "		Level.	570 "
	Level.	8400 "			
A	12 " "	5200 "			159370 feet, or 30 miles, 970 feet.
D	6 " "	2400 "			

TABLE of Gradients on the St. Lawrence and Atlantic Railroad, from Longueuil to Boundary Line.

Grade.	No. of feet.
Level.	220,430 feet of level Grade, 33 per cent.
Under 5 feet per mile.	41,900 " under 5 feet, 6 "
" 10 "	56,700 " " 10 " 9 "
" 15 "	41,700 " " 15 " 6 "
" 20 "	31,700 " " 20 " 4¾ "
" 25 "	38,400 " " 25 " 5⅞ "
" 30 "	37,840 " " 30 " 5⅞ "
" 35 "	19,400 " " 35 " 2⅞ "
" 40 "	29,300 " " 40 " 4⅜ "
" 45 "	30,000 " " 45 " 4½ "
" 50 "	84,500 " " 50 " 12⅝ "
" 58 "	35,800 " " 58 " 5⅜ "
	667,670 feet, or 126 miles, 2390 ft.

Under 45 feet per mile, 82 per cent., from 45 to 58, 18 per cent.

Total distance of Level,..................	41 miles 3950 feet.
" Ascending Grades,......	59 " 880 "
" Descending "	25 " 2840 "
	126 miles 2390 feet.

Signed, C. S. GZOWSKI,
Chief Engineer.

(D.)

LIST of Curves on the several Divisions of the St. Lawrence and Atlantic Railway.

Total degree of Curvature.	Length of Curve.	Nature of Curve.	Total degree of Curvature.	Length of Curve.	Nature of Curve.
First	*Division.*		*Second Division.*—	(*Continued.*)	
			6·08	1216 "	½
64·20	3210 feet.	2° (2865 ft. R.)	22·40	3360 "	40m
36·40	1820 "	2° (2865 ft. R.)	28·20	1410 "	2°
24·00	2400 "	1° (5730 ft. R.)	24·00	800 "	3°
40·00	800 "	5° (1146 ft. R.)	57·55	1151 "	5°
52·00	2600 "	2° (2865 ft. R.)	42·70	1220 "	3½
			43·52	1088 "	4°
216·60	10830 feet.		26·43	881 "	3°
	216° 36				
			510·81	39749 feet.	
				510° 48·36	
Second	*Division.*				
14·00	2807 feet.	30m			
5·80	1746 "	20m	*Third*	*Division.*	
14·00	2800 "	½	24·00	1200 feet.	2°
29·40	5881 "	½	12·30	2460 "	30m
33·84	3384 "	1°	10·50	350 "	3°
14·56	1456 "	1°	9·00	1350 "	40m
20·00	1000 "	2°	35·72	893 "	4°
43·83	1461 "	3°	8·70	435 "	2°
31·63	1898 "	1° 40m	35·82	1791 "	2°
18·07	2710 "	40m	9·00	900 "	1°
34·8	3480 "	1°	14·00	700 "	2°

D.

LIST of Curves on the several Divisions of the Saint Lawrence and Atlantic Railway.—(*Continued.*)

Total degree of Curvature.	Length of Curve.	Nature of Curve.
Third Division.—	(*Continued.*)	
9·91	991 feet.	1°
36·00	1440 "	2½°
28·26	942 "	3°
10·80	540 "	2°
8·62	1293 "	40m
8·27	1240 "	40m
9·02	451 "	2°
49·90	1361 "	3·40m
82·80	1656 "	5°
14·72	736 "	2°
22·05	882 "	2½°
42·30	846 "	5°
14·72	736 "	2°
22·05	882 "	2½°
42·30	846 "	5°
9·99	333 "	3°
42·70	1220 "	3½°
18·44	461 "	4°
26·82	894 "	3°
17·00	880 "	2°
32·96	1648 "	2°
13·00	650 "	2°
20·05	1002.50 "	2°
60·00	2000 "	3°
35·20	880 "	4°
46·00	1150 "	4°
4·00	800 "	30m
36·02	900.50 "	4°
41·71	1042·80 "	4°
51·00	1700 "	3°
102·73	2935 "	3·30m
17·50	875 "	2°
66·67	1333·30 "	5°
60·09	1800·00 "	3·20m
5·25	1050 "	30m
1267·80	48436 feet. 1267·48	
Fourth	*Division.*	
47·50	1900 feet.	2° 30m
31·27	1563.50 "	2°
39·18	3918 "	1°
9·73	973 "	1°

Total degree of Curvature.	Length of Curve.	Nature of Curve.
Fourth Division.	—(*Continued.*)	
39-32	983 feet.	4°
23·40	1560 "	1° 30m
45·90	1530 "	3°
90·00	3000 "	3°
65·60	3280 "	2°
36·00	900 "	4°
17·03	681 "	2° 30m
36·50	2433 "	1° 30m
60·50	3025 "	2°
70·80	2360 "	3°
32·00	1600 "	2°
30.00	1500 "	2°
30·90	1030 "	3°
22·00	2200 "	1°
36·25	1250 "	2° 30m
36·00	1800 "	2°
20·75	830 "	2° 30m
11·00	1100 "	1°
16·00	800 "	2°
69·00	2300 "	3°
20·00	1000 "	2°
24·50	700 "	3° 30m
19·80	660 "	3°
24·00	960 "	2° 30m
31·50	1050 "	3°
39·48	1316 "	3°
33·00	1650 "	2°
18·00	1800 "	1°
20·00	1000 "	2°
75·00	1875 "	4°
49·98	1428 "	3° 30m
30·00	1000 "	3°
84·99	2833 "	3°
46·50	2325 "	2°
31·50	1050 "	3°
49·00	1400 "	3° 30m
74·00	2220 "	3° 20m
31·00	930 "	3° 20m
20·00	1000 "	2°
84·74	2421 "	3° 30m
49·16	1229 "	4°
1772·78	72363 feet. 1772° 46′48″	

1st Division.................	216° 36′	10,830
2nd "	510° 48′36″....	39,749
3rd "	1267° 48′36″....	48,436
4th "	1772° 46′48″....	72,363
Total......................	3767° 59′24″	171,378, 32 m., 2410 ft.

Signed, C. S. GZOWSKI,
Chief Engineer.

Montreal, 15th December, 1852.

(E.)

Statement of the highest and lowest prices for each description of work given to the Contractors on the St. Lawrence and Atlantic Railway.

Description of Work.	Minimum Rate.			Maximum Rate.			
	£	s.	d.	£	s.	d.	
Grubbing and Clearing, per acre,	3	10	0	7	10	0	
Earth Excavation, Road Bed, per cubic yard,	0	0	6¾	0	0	9½	
Loose Rock Excavation, per cubic yard,	0	1	6	0	2	0	
Solid Rock, " "	0	4	6	0	5	6	
Slate Rock, " "	0	2	0	0	2	6	
Extra haul after 300 feet, per 100 feet,	0	0	0½	0	0	0½	
Earth Excavation, in Foundation, per cubic yard,	0	0	8	0	1	0	
Solid Rock, in Foundation, per cubic yard	0	5	0	0	5	6	
Bridge, Masonry, Rubble, "	0	14	6	1	10	0	
Masonry in Foundations, "	0	5	0	0	7	6	
Arched Culverts, Masonry, Lime, per cubic yard,	1	4	0	1	15	6	
Box Culverts, Masonry, Dry, per cubic ft.	0	10	0	0	12	6	
" in Lime, "	0	12	6	0	15	0	
Timber in Culvert Foundation, per M ft., B. M.,	2	0	0	2	15	0	
Plank in do per M. ft., B.M.	3	0	0	4	0	0	
Superstructure of Bridge, per lineal ft.,	3	10	0	5	10	0	
Upright supporting Wall, per cubic yard	0	7	6	0	10	0	
Laying Track, per mile,	72	0	0	72	0	0	
Ballasting, per cubic yard,	0	0	7½	0	1	0	
Wrought Iron Chairs, per lbs.,	....			....			4½ cents per lb. in Boston, duty 12½ per ct., Fright £1 10s per ton to Montreal
Cast Iron Chairs, per ton,	10	0	0	10	0	0	
Spikes, per cwt,	0	16	6	0	16	6	
Cross Ties, per tie,	0	0	7½	0	1	1	

Signed, C. S. GZOWSKI,
Chief Engineer.

Montreal, 9th December, 1852.

F.

Statement shewing the length of Bridging on the St. Lawrence and Atlantic Railway.

On the 1st Division	1057 feet.
" " 2nd "	1585 "
" " 3rd "	789 "
" " 4th "	580 "
Total of Bridging	4011 feet.

The Bridges are of the following spans:—

From 15 to 20 feet	380 feet.
" 20 " 50 "	85 "
" 50 " 80 "	493 "
" 80 " 100 "	200 "
" 100 " 120 "	1002 "
" 120 " 150 "	1660 "
" 150 " 174 " overbridge	191 "
	4011 feet.

The length of Bridging here given includes not only the span, but the entire length of Bridge from the extreme ends of abutments.

(Signed,) C. S. GZOWSKI,
Chief Engineer.

Montreal, 18 December, 1852.

(G.)

Replies to Inquiries of Samuel Keefer, Esq., Chief Engineer of Public Works, respecting the Works on the St. Lawrence and Atlantic Railway.

Query No. 5.	*Answers.*
Statement of the force employed upon the Road on the 1st November, 1852, and the probable period of completion of each division.	Number of men............... 2347 " of horses and carts...... 483 " of earth carts........... 26 The entire Road will be completed in August, 1853, except the ballasting of some of the portions which will not be completed before the Summer of 1854.
The number of miles of Track laid and still to lay.	Number of miles of Main Track. Laid...................... 98 miles. To lay.................... 28 " Total 126 miles.
Number of miles of Sidings laid and still to lay.	Number of miles of Sidings Laid...................... 6 miles. To lay.................... 4 " Total 10 miles.
Form of Rail; weight per lineal yard; the works from whence supplied and price, per ton, delivered at Montreal; the weight of chairs wrought and cast; length and weight of spikes, the number and weight per mile.	Bridge Rails, 63 lbs. to the lineal yard, Coalbrooke and Ebberoale Companies; the portion from Longueuil to St. Hyacinthe cost £12 currency perton, on the other divisions £8 12s. 6d. and £8 2s. 6d. per ton. Cast iron Chairs.............. 18 lbs. Wrought iron................ 13 " Spikes 6 inches long, weight about ½ lb. each.
The length, face and thickness of Ties, and the kind of wood allowed to be used.	9 feet in Sections not less than 6 × 8, Cedar, Tamarac and Hemlock, and a few of Black Ash.
Number of Engine houses and shops, and number of Station houses, and water tanks, built, and remaining to be built.	3 Engine houses, Longueuil, Richmond and Sherbrooke, one work shop at Longueuil; 3 principal Stations, Longueuil, Richmond and Sherbrooke; 5 Way Stations and tanks built, and 5 more to build, also sheds at Longueuil, wharf for storing Goods, wood sheds and freight sheds at other points.

Queries.	*Answers.*
Total length of Trussed Bridging on the Road, classified according to their spans; copy of the plan of Brompton Bridge, Statement of the contract, prices for the different classes of work in each section.	All this will be given as soon as the plans can be prepared, and the detailed statement drawn out.
A copy of the general specification for grading and forming the Road.	The specifications accompanies the Statement.
The estimated cost of reducing the gradients West of the St. Francis River, to 45 feet per mile, to make them correspond with the maximum grade between Richmond and the Province Line.	I estimate the cost at £20,000 Cy.

Rolling Stock now on the Road, and what is contracted for, for the service of the Road at its opening to the Atlantic.

Number of First Class passenger Cars in use	7,	contracted for	3,	Total	10
“ “ Second Class	2,	“	5,	“	7
“ “ Baggage Cars	2,	“	2,	“	4
“ “ Express Cars			3,	“	3
“ “ Covered House Cars	23,	“	120,	“	143
“ “ Platform Cars	93,	“	90,	“	183
				Total of Cars	350

First Class Engines on the Road	13,	contracted for 9,	Total 22
Second “ “ “	2,		2
			24

(Signed,) C. S. GZOWSKI,
Chief Engineer.

Montreal, 9 December, 1852.

H.

Specification of the manner of grading and forming the Road-bed of the St. Lawrence and Atlantic Railroad.

Width of ground for Road. The ground to be occupied and set apart for the Road is to be, in no case, of less width than 99 feet, and of such additional width as may be necessary.

Grubbing and clearing. When the line of Road passes through wooded land, it is to be cleared for a distance of 100 feet on each side of the centre of the line, of all trees, stumps, logs and rubbish, the trees, stumps and bushes to be cut close to the surface of the ground, and the whole to be removed beyond the limits above stated, or destroyed by fire or other means.

All trees and stumps shall be thoroughly grubbed, and all vegetable matter removed from under all embankments which do not exceed three feet in depth, and for the entire space covered by such banks.

All suitable and approved timber within the limits of the Road can be used in the work.

Witdth of Road-bed. When the road is graded for a single track, it will be 15 feet wide on the embankments, and 22 feet wide at the foot of the slopes in excavations; the side ditches are included in the last mentioned width, and will be from 3 to 5 feet, (at the surface of the road-bed,) and from 1 foot to 1 foot 6 inches deep, with such slope as the Engineer may require.

When the Road is graded for a double track, the Road-bed will have a surface width on the embankments of 26 feet, and in excavations 34 feet, the side drains will be of the same dimensions as above stated,

Slopes and preparing the surface earth to receive embankments. The slopes of the excavations will usually be one and a-half feet base to one foot vertical, unless it is in places where the nature of the material will require a greater slope, which will be determined by the Engineer.

In rock cuttings the slopes will be from four to six inches horizontal to one foot vertical.

When the surface soil is not suitable to raise embankments upon, it shall be excavated (marked) previous to raising an embankment upon it, and when that may not be considered sufficient, brush will be placed on the surface, and upon it the bank will be raised. The extent and nature of this work will be determined upon by the Engineer.

Excavations below grade in cutting. In excavations where the material of the grade line may be unfit for the road-bed, it shall be excavated to such a depth below grade as may be considered by the Engineer necessary, and the portion so excavated filled with the best material that can be obtained on or near the work.

Ballasting. The whole Road is to be covered with gravel or very coarse sand, upon which the superstructure is to rest for a depth of not less than 2 feet. Where the Road cannot be covered with that description of material previously to laying down the superstructure, it shall be done afterwards in accordance with the specification for that description of work.

Forming embankments. When embankments are formed by carting, they shall, if required, be made in layers not exceeding 4 feet in thickness, and, in making the banks, the slopes will always be carried up full, and be faster than the centre; no vegetable matter, or stumps, logs and perishable material, will be allowed to be placed in the bank, but will be removed beyond its limits.

All embankments made up to grade with material from cuttings, must be entirely free from stone to a depth of at least two feet below grade, the surface in all cases to be dressed with the best material.

Drains at foot of embankments. When side drains will be made at the foot of embankments, a brim will be left between the foot of the bank and the foot of the drain, of such an extent as may be decided by the Engineer.

Disposition of earth in Cuttings. All the earth excavated from the Road bed has to be carried into embankments unless otherwise directed by the Engineer.

The surplus materials will be used to form double tract embankments, and where there may be a deficiency of material to form the banks, the excavation for the Road bed will be made for a double tract, or the earth procured from such points as may be directed by the Engineer.

Surplus earth from excavation. The surplus earth from excavations, which cannot be carried into embankments, shall be deposited on the sides of the excavations (thrown in spoil), leaving such a brim between it and the outside birm of the excavation as may be considered necessary by the Engineer.

The earth so deposited shall in all cases be placed regularly and in such manner as to drain the surface water from the Road; all trees where a spoil bank may be deposited, are to be cut down.

Surface drains. Where surface drains outside the slopes of cuttings may be required for the purpose of preventing the surface water from falling into the cuttings, they shall be made of such dimensions as may be directed by the Engineer.

Lateral drains in side cuttings. Where lateral drains, or drains in side cuttings to carry off the water from the springs or streams in side hills will be required, they will be made of such an extent and dimensions as may be directed by the Engineer, and the earth from them must be deposited with a sufficient birm on the sides of the drains to prevent it from falling in and obstructing the drainage.

Under ground drains in side cuttings. Where drains from side hills in side cuttings are carried across the road, they will be constructed of stone and will be of sufficient size, protected at the upper side, from being cut away by the fall of the water.

Measurement of earth work. Every description of material required to form the road bed, will be measured in excavation.

Road and Farm crossings, &c. &c. The embankments or excavations required for road or farm crossings, bridges, and changing the channels and beds of streams, shall be of such dimensions and slopes as the Engineer will direct. No public road intersecting the line of Railway shall be obstructed by excavations or embankments until notice shall be given by the Engineer for completing such road crossings, when safe temporary roads for the use of the public will be provided.

Classification of materials. When necessary, the material used for forming the bed of the Road will be classified by the Engineer under the following heads:—Common earth, loose rock, slate and slate rock, and solid rock. All stone of not less than one cubic foot, and not exceeding one cubic yard, will be called loose rock, and will have to be deposited in regularly formed piles, convenient for the work for measuring. All rock in place requiring blasting, and all detached masses of rock, exceeding one cubic yard, will be called solid rock.

Measurement of hawl. When necessary, measurement to the extent of hawl will be made by the Engineer.

If, during the progress of the work, any changes are necessary with the view to perfecting the allignment of the Road, or giving more ease to the curves, together with the variation of the grade line, it shall be done according to the direction of the Engineer, and no extra allowance will be claimed therefor.

Finishing of Road-bed Before the Road will be considered finished and accepted as such by the Engineer, all the excavations and embankments must be properly and neatly trimmed, and the surface of the Road-bed brought to the required grade. All settlements, washings or crumbling of banks, or in cuttings, will have to be made up and repaired, until the surface of the Road assumes the required bed permanently.

Where retaining walls are required, they will be built of dimensions as the Engineer may direct, and upon solid and permanent foundation ; the stone used in the retaining walls will be of durable character, well shaped and of sufficient size to make a strong and durable wall. They must be built so as to form a perfect bond throughout the entire thickness, the beds of the stone being laid at right angles with the battered face, and the whole neatly coped with flat stones at least two feet wide and three feet long. These walls will be laid in quick lime, or dry, as may be directed by the Engineer.

Slope walls. Where slope walls are required, they will be built of dimensions and extent directed by the Engineer, on a permanent foundation, and in a substantial manner of material approved by the Engineer. Where these walls may be founded in deep water, the foundations will be of brush and stone, laid so as to form a bond, and protected from the action of the water by a rip rap wall made of large stones laid with sufficient slope.

Culverts. The culverts on the Road will be of two kinds, square box culverts and arched culverts.

Square or Box Culverts. The square box culverts will be built of rubble masonry, laid in quick lime, or dry, as the Engineer may direct; they will have an opening from two to three feet wide, and from two to five feet high, the thickness of the wall will be according to the size of the culvert, from two to four feet, but it is in no case to be less than one and a half feet. The stones of which the culverts are to be built will be of a durable character, well shaped, and laid so as to form a perfect bond throughout; they will be covered with large flat stones, lapping six inches to one foot upon each side wall, according to the depth of the embankments covering them, and being from six to twelve inches thick, as the Engineer shall deem necessary, laid close to prevent the earth from falling into the culverts.

Foundation for box culverts. The foundation shall be of a permanent character; if of timber, they must be sunk below the surface so as to ensure their being constantly covered with water, if of stone, they will be of flat stones, laid edgewise in regular courses across the culvert. The stones shall not be less than one foot deep, and they shall be well rammed down with heavy beetles, and all the spaces and crevices filled with smaller stone. When required, a course of water-tight sheet piling will be placed at each end of the culvert, extending to not less than three feet below the bottom of the foundation, to prevent it from undermining.

End and wing walls of box culverts. The end walls of the culverts shall be built with a slope to meet the slope of the bank, or square, as the Engineer may direct, with large stone, hammer dressed on the end faces, in a manner to give the work a neat and substantial appearance; the largest culverts of this description will have the end walls carried up square, with wing walls of such a length as may be directed by the Engineer. The end and wing walls to be coped with flat stones, not less than six inches thick, and projecting at least three inches over the general face of the wall. All end and wing walls will be properly pointed.

Arched culverts will be of not less than six feet span, they will be founded on rock, or have stone foundations, similar to the stone foundations in box culverts; when timber foundations will be decided upon, it will consist of flatted timber not less than eight inches thick, laid two feet from centre to centre crossways of the culvert. The timber will be covered with three inch plank spiked or pinned, and the ends of the culvert perfectly secured from undermining with sheet piling.

Arch Stones. The arched stones to be of sufficient depth to extend through the thickness of the arch, placed perpendicular to the curve of the same, and well and closely fitted. The outer wing stones of the arch to be of uniform length, and as much so in thickness as possible; they will be dressed to what is termed rock work, to be well bonded with contiguous arch stone breaking points at least eight inches.

Wing and end walls. The wing and end walls of the arched culverts are to be formed of the larger and better shaped stone, dressed on their exterior faces and pointed with lime or cement, they are to be surrounded with a coping of broad stones of the dimensions specified in the plan. The coping stones to be dressed, and brought as near to an uniform thickness as possible, and placed firmly and securely upon the walls in a bed of lime or cement.

Abutment walls. The abutment walls to be of good rubble masonry, built of durable stone, bounded and laid in full mortar, made of the best hydraulic cement or quick lime, and clear sharp sand mixed in a proper manner, and in such proportions as directed by the Engineer. The vertical joints will be grouted, the grout to be made of cement or lime and sand, with a proper admixture of water.

Cattle guards and passages. Cattle guards and passages will be built of stone or wood, as the Engineer may direct. When of stone they will consist of two walls of rubble masonry, laid in lime in a substantial manner, placed from four to six feet apart, coped to receive a sill on the top of each wall; when the passages are designed to pass water, their foundations shall be constructed in the same manner as those of the culverts.

Wood cattle guards or passages are to be of wood, they will consist of two bents, placed at the requisite distance apart, sheeted on the side next the bank with three inch plank, the bents will be retained in their proper position by cross timbers, substantially framed into the sills and cap pieces.

General Clauses. The masonry and foundations in the bridges, as well as all other work connected with the Rallroad, will be described in the specification for each bridge, and each description of work.

The propositions and dimensions of several parts of culverts, bridges, and of every other mechanical work will be represented in the plans.

No masonry shall be laid in mortar, unless by special direction, between the 1st of October and 1st of April.

All materials to use for every description of work must be examined and approved by the Engineer or Superintendent, and when considered by him unsuitable, must be immediately removed to such a distance as he may deem necessary, in order to prevent them from being used in the work.

No advantage is to be taken by the Contractors of any omission either in the specification or plans, but the entire work is to be executed in good faith, in a substantial, faithful and workmanlike manner, subject to the constant supervision and inspection of the Engineer or Superintendent, who shall give such directions from time to time, additional and explanatory of the above specification, as occasion may require.

(Signed,) C. S. GZOWSKI,
Engineer, St. Lawrence and Atlantic Railway.

Engineer's Office, Montreal.

Montreal, 17*th December*, 1852.

Sir,—Will you be so good as to favor me with the terms and conditions of the contract originally entered into by the Directors of the St. Lawrence and Atlantic Railway with Messrs. Black, Wood and Co., for the construction of their Road, and the reasons which induced the Directors to break up that Contract, and re-let the work.

From the statements you have furnished me, I observe that (exclusive of engineering, interest, discount and contingencies) the Road is estimated to cost £8,133 per mile, when brought into operation.

I have the honor to be, Sir,
Your obedient servant,

(Signed,) SAMUEL KEEFER,
Chief Engineer, Public Works.

A. C. Webster, Esquire,
Secretary, St. Lawrence and Atlantic Railroad,
Montreal.

QUEBEC:
PRINTED BY JOHN LOVELL, AT HIS STEAM PRINTING ESTABLISHMENT,
MOUNTAIN STREET.

JAN. 30/31